South Florida Ecosystem Restoration Project Activities

Integrated Financial Plan

1998

Notes: Financial requirements for individual projects within this edition of the Integrated Financial Plan are the best available at the time of printing. Project financial requirement information beyond FY 1998, should be verified with the lead agency and/or project manager prior to any use for budget formulation purposes.

South Florida Ecosystem Restoration Task Force

Approved by the Task Force 06/24/98

Integrated Financial Plan-1998

South Florida Ecosystem Restoration Project Activities

Acknowledgements

Working Group Agencies and Entities of the South Florida Ecosystem Restoration Task Force:

Federal:
- United States Department of Agriculture
- United States Department of Army
- United States Department of Commerce
- United States Department of Interior
- United States Department of Justice
- United States Department of Transportation
- United States Environmental Protection Agency

Local:
- Dade County

State:
- Florida Department of Agriculture and Consumer Services
- Florida Department of Community Affairs
- Florida Department of Environmental Protection
- Florida Department of Transportation
- Florida Game and Fresh Water Fish Commission
- Governor's Commission for a Sustainable South Florida
- Office of the Governor of Florida
- South Florida Water Management District

Tribes:
- Miccosukee Tribe of Florida
- Seminole Tribe of Florida

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For more information on the South Florida Ecosystem Restoration Program please visit http://www.sfrestore.org

Integrated Financial Plan-1998
South Florida Ecosystem Restoration Project Activities

Contents

Integrated Financial Plan-1998

1.0 Introduction

1.1 OVERVIEW - The IFP-1998 has been prepared by the South Florida Ecosystem Restoration Task Force to meet the requirements of the Water Resources Development Act of 1996 (WRDA). WRDA states that the Task Force is required to "prepare an integrated financial plan and recommendation's for a coordinated budget request for the funds proposed to be expended by agencies and entities represented in the Task Force for restoration, preservation, and protection of the South Florida ecosystem. "

The IFP-1998 includes the following sections:

1.0 Introduction
2.0 Index of Restoration Projects
3.0 Project Descriptions and Maps
4.0 Integrated Science Plan
5.0 Appendix

With this third edition of the IFP, the Task Force and the Working Group are continually expanding it's scope to be as comprehensive as possible and to include local government and private sector restoration project activities. Eventually, all Task Force and Working Group endorsed projects will be categorically grouped and "filed" in the IFP, with critical project linkages identified.

Prepared by Task Force and Working Group members, and compiled by the Office of the Executive Director, the IFP-1998 is designed to facilitate annual budget development. By serving as a key reference source for all South Florida Ecosystem restoration projects, the IFP-1998 will assist decision makers in undertaking their responsibilities and establishes a foundation for long-term project plans and financial requirements.

The IFP identifies the most up to date financial requirements for specific projects and is designed to achieve the restoration goals of the South Florida Ecosystem. Accordingly, the IFP serves as a useful tool in planning and aligning interagency restoration to maximize coordination and eliminate duplication of efforts and/or resources.

1.2 ORGANIZATION OF RESTORATION PROJECTS -
The Projects sections of this document consists of two primary parts:

- Index of Restoration Projects:
Summary matrix table of all project descriptions contained in Section 3.
- Project Descriptions :
An individual summary sheet is provided in Section 3 for each restoration project and includes the information categories as described below.

1.3 INDEX OF RESTORATION PROJECTS –
The individual project descriptions in this document are indexed by sub-region and project ID number. The index includes the complete project title, the project ID, the sub-region in which the primary project activity will occur, project start and end dates, project plan manager (PPM), lead organization, financial requirement dollars, dollars appropriated to date and the number of the page in IFP-1998 where the project description is located. For convenience, the project summary index is presented immediately following this introduction.

1.4 PROJECT DESCRIPTIONS -
In Section 3.0, project descriptions are subdivided into 7 units. The first unit, entitled "The Total System" includes "Total System" projects that affect most or all of the South Florida Ecosystem, e.g., the C&SF Project Comprehensive Review Study. The subsequent 6 units describe projects that are

physically located in or affect one or two of the 6 sub-regions which constitute topographic and physiographic subdivisions of the total South Florida Ecosystem (Note: multiple sub-regions affected by a particular project are indicated).

Each sub-regional section of the IFP includes a map of the sub-region and a brief overview description of the ecological conditions in the sub-region. The topics discussed within the overview section include the following: "Ecological Setting;" "Linkage to the Total System;" "Ecosystem Problems and Restoration Objectives;" and "Restoration Projects." These narratives are intended to inform the reader and provide a linkage between the condition of the ecosystem in the sub-region and the need(s) for restoration activities.

The individual project summary sheets follow the ecological condition description. For the purposes of this IFP document a **"project"** is defined as:

"A single and/or multi-agency restoration activity, intended to achieve a pre-determined objective with identified time frames, milestones, and resources required for completion."

Each project is presented on a **"Project Summary Sheet"(PSS)** containing the following fields of information:

TITLE - This field contains the official standardized name of the project.

SUB-REGION -For project nominations, the boundary of the South Florida Water Management District defines the South Florida Ecosystem ("total system") included in the restoration initiative. The "total system" has been subdivided into 6 sub-regions (as shown in Table 1 at the end of this section). This field contains the code (shown below) of the sub-region(s) in which the project is located. Projects with activities located in two or fewer sub-regions are identified using the numeric code of the sub-region(s), with the sub-region containing the primary activity shown first. Projects with activities located in three or more sub-regions are designated by the letters "TS," indicating the "total system". (Refer to the maps provided within each section for the sub-regional boundaries.)

PROJECT ID - This field provides a permanent, unique identification number for the project. Project ID numbers are assigned and distributed by the Office of the Executive Director. The number will subsequently be used for cross-reference and for identifying inter-dependent projects. Project ID numbers will include an alpha prefix (see above) that describes the sub-region in which the project is primarily located and the section of the IFP in which the Project Summary Sheet is filed.

PROGRAM CATEGORY - This field identifies the broad functional programmatic category. Projects are in *only one* of the following categories: Infrastructure, Land Acquisition, Management, Science, or Public Information and Education.

BUDGET CATEGORY - This field refers to the funding categories used in the FY 99 Federal Cross-Cut Budget for the South Florida Ecosystem restoration initiative: Area Management, Natural Resources Management, Water Quality and/or Habitat Protection, Information Management and Assessment, Monitoring, Research, Land Acquisition, or Infrastructure Investment. (More than one type may be specified if appropriate).

PROJECT PLAN MANAGER - This field identifies the person (and telephone number) responsible for preparing or coordinating preparation of the Project Summary Sheet. The Project Plan Manager verifies the original information on the Project Summary Sheet, ensuring the sheet is completed fully and accurately, and updates the sheet periodically to reflect the latest project status. Once a project is filed in the IFP, the PPM is responsible for providing minor revisions to the Project Summary Sheet directly to the Office of the Executive Director for updating the on-line version and the next hard-copy revision of the

IFP. Minor revisions include updating header information provided on the sheet and identifying completion of project milestones.

BASIS - This field provides general information on the basis or primary reason that the project is sanctioned by the Working Group as a component of the comprehensive restoration plan. That is, it provides a programmatic "justification" in the context of individual organization missions or Task Force overall restoration objectives, or both. The information is intended to assist policy and budget staff in determining the significance of a particular project to the restoration effort. The following numeric codes are used:

"1" - indicates one or more of the Task Force priorities identified in the original Interagency Agreement (September 1993) or revised Task Force priorities (June 1995).

"2" - indicates a project designed and intended expressly for the purpose of "Ecosystem Restoration."

"3" - indicates an agency programmatic or standard mission project that also results in significant restoration benefits.

LEAD ORGANIZATION (S*)* - This field identifies the project proponen*t* Working Group member organization that agrees to provide programmatic management and inter-agency coordination, once the project is implemented. In some cases, projects may be managed jointly by two or more organizations. The "Lead Organization" may or may not provide a source of funding for the project, but, at a minimum, agrees to seek financial resources either internally, externally, or a combination.

SUPPORTING ORGANIZATION (S*)* - This field identifies organizations that provide a significant level of technical, consulting, regulatory, or financial support.

COUNTY - This field contains the name(s) of the county in which the project is located. "All" indicates projects, which affect all of the counties in the Total System.

LINKED PROJECTS - This field identifies other closely associated or linked projects that either are themselves "dependent on completion" of the subject project, or "critical to completion" of the subject project. Other projects, particularly science projects, may be neither "critical to" nor "dependent on" a particular project but, nevertheless, be significantly related; such projects are identified in this field as "associated with." Linked projects are identified by a permanent, unique project identification number assigned by the Office of the Executive Director (see above field, entitled "Project ID").

START and END - These fields refer to calendar years in which a project starts and ends.

FINANCIAL REQUIREMENT - This field describes the life-of-project cost, i.e., the total cost of the project (from implementation through conclusion), but excludes post-project operation and maintenance. Where more than one organization is involved in funding, the field includes the organizational "split" or share of the total funding requirement.

APPROPRIATED TO DATE - This field contains the amount of funding appropriated (but not necessarily expended) through the end of the fiscal year immediately preceding the current publication year of the IFP.

REMAINING FINANCIAL REQUIREMENT - This field shows the projected costs from the beginning through the conclusion of the project, but excludes post-project operation and maintenance. Where more than one organization is involved in the funding, the field includes the organizational "split" or share of the total funding requirement. The amount of the "Remaining Requirement" generally will be reduced with each successive edition of the IFP as a result of work completed and funding expended during the previous year.

APPROVED - This field contains the date of the Working Group's approval of the project.

LAST REVISION - This field contains the date of the last revision of the Project Summary Sheet and is based on the date the IFP was sent to the printer for publication..

Table 1. Sub-region reference table

Numeric Sub-region Code	Sub-region Name	Alpha Prefix
TS	Total System	TS
01	Kissimmee Valley	KV
02	Greater Lake Okeechobee	GL
03	Central Everglades	CE
04	Southeast Urban and Coastal Areas	SE
05	Southwest Florida/ Big Cypress Basin	SW
06	Florida Keys	FK

Table 2. Index of Restoration Projects (sorted subregionally)

	Project ID No.	PPM	Lead Organization	Start	End	Financial Requirement	Appropriated to Date	Page
Total System								
C&SF Project Comprehensive Review Feasability Study (Including WPAs and EAA Storage)	TS01	Ornella	USACE	1997	2004	19,955,000	13,135,000	18
Manatee Protection Gate Modifications	TS02	Dollar	USACE	1997	2000	9,170,000	1,500,000	19
Melaleuca Quarantine Facility	TS03	Center	ARS	1997	2000	5,000,000	1,000,000	20
Agriculture Land Stewardship	TS04	Smola	NRCS	1997	2008	10,920,000	0	21
BMPs for Agriculture	TS05	Hendricks	NRCS	1997	2007	32,050,000	4,000,000	22
Economic Analysis of Agricultural Land and Water Management	TS10	Caswell	USDA	1997	2002	1,845,000	0	23
Exotic Pest Plant Controls in South Florida Ecosystems	TS11	Center	ARS	1998	2006	7,307,000	2,547,000	24
Fire Management Plans for Public Lands	TS13	Folks	FDACS	1998	2003	2,600,000	0	25
Florida Greenways System Implementation - Federal Involvement	TS14	Caffin	USFS	1997	2010	366,000	0	26
Multi-Species Recovery Strategy	TS19	Johnson	USFWS	1995	END	8,000,000	0	27
Pollution Prevention	TS22	Smola	NRCS	1998	2002	870,000	0	28
Supplemental Water Quality Treatment Technology Demonstration Projects	TS23	Aumen	SFWMD	1997	2001	10,000,000	2,042,350	29
Technical Assistance to Seminole and Miccosukee Indian Reservations	TS24	Smola	NRCS	1997	2008	3,900,000	50,000	30
Wetland Reserve Program	TS27	Hendricks	NRCS	1997	2008	2,135,000	100,000	31
Public Lands Information Center	TS32	Ring	NPS	2000	2009	1,800,000	0	32
Video Series	TS37	Cook	NPS	1997	2008	284,000	0	33
WEB Connection	TS38	Plumb	OED	1997	2008	152,000	32,000	34
Models and Model Enhancements	TS40	Higer	USGS	1995	2001	11,045,000	6,080,000	35
Distributed Information System and Mapping	TS41	Higer	USGS	1995	2001	4,437,000	2,989,000	36
High Density Topographic Surveys	TS42	Higer	USGS	1997	2001	7,325,000	925,000	37
Limitations of Environmental Stresses and Physiological Resposes on Crop Productivity	TS43	Sinclair	ARS	1995	2000	175,000	70,000	38
Ecosystem History	TS44	Higer	USGS	1995	2001	3,008,000	2,008,000	39
Biological Control and Ecology of Intrusive Pest Plants	TS50	Center	ARS	1997	2006	7,792,000	2,547,000	40
Geodetic Vertical Control Surveys	TS52	Woolam	FDEP	1997	2002	1,563,000	0	41
Ecosystem History: Studies of Land Use and Ecological Change	TS53	Patterson	FDEP	1998	2004	1,062,000	0	42
Assessment of Endocrine Contaminants in the Florida Everglades	TS54	Axelrad	FDEP	1998	2001	744,000	0	43
Natural System Boundary Alternatives and Natural Lands Information System	TS55	Haddad	FDEP	1998	2000	310,000	0	44
Identification and Documentation of Ecosystem Reference Areas as a Biodiversity Monitoring Framework	TS56	Minasian	FDEP	1999	2000	200,000	0	45
Integrated Management Program for Invasive Species within High Quality Natural Areas of South Florida	TS61	Jipsen	USACE	1998	2002	34,000,000	0	46
Public Education for the Restoration Project	TS62	Lewis	FDEP	1998	2000	50,000	0	47
Lygodium Microphyllum Control	TS63	Thayer	SFWMD	1998	2011	3,500,000	95,000	48

	Project ID No.	PPM	Lead Organization	Start	End	Financial Requirement	Appropriated to Date	Page
Mercury, Geochemistry, and Nutrient Process Studies	TS67	Higer	USGS	1995	2001	4,722,000	3,122,000	49
Coordinated Management Program for Invasive Plant Species On Public and Private Lands in South Florida	TS83	Jipsen	USACE	1998	2002	40,000,000	0	50
Biological Control for Melaleuca and other Invasive Exotics Species Enhancement Program	TS84	Jipsen	USACE	1998	2002	5,310,000	0	51
Seminole Tribe Data Collection and Monitoring	TS85	Tepper	Seminoles	1997	2010	6,384,000	135,000	52
Seminole Tribe Development of Water Quality Standards	TS86	Tepper	Seminoles	1995	2000	108,000	64,000	53
Subtotal for Total System:						**248,089,000**	**42,441,350**	
Kissimmee Valley								
Kissimmee River Restoration Project	KV01	Brooks-Hall	USACE	1994	2009	494,800,000	132,371,000	60
Lake Istokpoga Ecosystem Restoration and Management	KV02	Ford	FGFC	1998	2002	17,325,000	7,655,000	61
Lake Wales Ridge National Wildlife Refuge and CARL Acquisition	KV03	Johnson	USFWS	1997	END	44,783,000	26,486,980	63
Paradise Run	KV04	Rinaldi	SFWMD	1998	2001	12,281,656	2,281,656	64
Upper Lakes Basin Watershed	KV06	Rinaldi	SFWMD	1995	2001	38,135,319	13,230,519	65
Kissimmee Prarie Ecosystem	KV07	Rinaldi	SFWMD	1996	1997	25,611,290	21,953,790	66
Kissimmee Chain of lakes Drawdown/Restoration Project	KV09	Hulon	FGFWFC	1999	2010	32,000,000	0	67
Hydrilla and Floating Plant Management in the Kissimmee Subregion	KV11	Zattau	USACE	1998	2002	40,202,000	0	68
Subtotal for Kissimmee Valley:						**705,138,265**	**203,978,945**	
Greater Lake Okeechobee								
Herbert Hoover Dike Stabilization	GL01	Brooks-Hall	USACE	1995	2006	250,000,000	3,448,000	82
Fisheating Creek	GL02	Rinaldi	SFWMD	1997	2001	5,000,000	5,000,000	83
Lake Okeechobee Regulation Schedule Review	GL03	Brooks-Hall	USACE	1996	1998	697,000	578,000	84
Buck Island Agroecology Study	GL04	Steinman	SFWMD	1991	2010	12,000,000	6,000,000	85
Lake Okeechobee Water Retention	GL06	Rosen	SFWMD	1997	2002	12,000,000	325,000	86
Lake Okeechobee Tributary Sediment Dredging	GL07	Rosen	SFWMD	1997	2001	3,800,000	150,000	87
West Palm Beach Wetland Reclamation Project	GL08	Olson	COWPB	1996	1999	34,219,973	6,682,516	88
Atlantic Ridge Ecosystem	GL09	Rinaldi	SFWMD	1996	2002	54,000,000	15,000,000	89
Indian River Lagoon	GL10	Rinaldi	SFWMD	1997	2002	25,666,460	5,128,288	90
Juno Hills	GL11	Outland	FDEP	1997	1997	19,479,343	14,975,430	91
Loxahatchee River	GL12	Rinaldi	SFWMD	1984	2001	11,927,120	11,927,120	92
Loxahatchee Slough	GL13	Rinaldi	SFWMD	1996	2002	21,000,000	17,000,000	93
North Fork St Lucie River	GL14	Rinaldi	SFWMD	1995	2002	11,632,000	4,617,000	94
North Savannas	GL15	Rinaldi	SFWMD	1997	2002	5,000,000	0	95
Pal-Mar	GL16	Rinaldi	SFWMD	1997	2002	24,000,000	11,000,000	96
South Fork St. Lucie River	GL17	Rinaldi	SFWMD	1995	1996	2,480,000	2,480,000	97

	Project ID No.	PPM	Lead Organization	Start	End	Financial Requirement	Appropriated to Date	Page
Indian River Lagoon National Estuary Program	GL 18	Smith	IFAS	1997	2002	2,000,000	500,000	98
Indian River Lagoon Restoration Feasibility Study	GL19	Hornung	USACE	1997	2001	6,150,000	1,745,400	99
Upper East Coast Regional Attenuation Facilities/Water Preserve Areas	GL21	Warner	SFWMD	1996	2001	80,000,000	0	100
Agricultural Contribution to Carbon Cycling	GL22	Allen	ARS	1996	2001	1,797,980	359,596	101
Ecological Impact of Water Project for Ten Mile Creek Property	GL23	Arnold	UF-IFAS	1997	2007	3,125,000	0	102
L-8 Canal Water Catchment Area - Loxahatchee Slough Infrastructure improvements	GL24	Olson	COWPB	1997	1998	3,200,000	500,000	103
Ten Mile Creek Water Preserve Area	GL25	Unsell	SFWMD	1996	2001	30,000,000	0	104
Loxahatchee Slough Ecosystem Restoration	GL26	Lund	SFWMD	1997	2000	2,050,000	0	105
Cypress Creek Restoration Project	GL28	Sexton	DCA	1997	1999	15,000,000	4,200,000	106
Allapattah Flats	GL29	Rinaldi	SFWMD	1997	2001	60,000,000	0	107
Bolles and Cross Canal Improvements	GL30	Brooks-Hall	USACE	1997	1999	1,100,000	751,000	108
Everglades Program	GL31	Goforth	SFWMD	1994	2014	837,925,000	214,148,000	109
EAA Lands/Water Management area(s) - Land from Willing Sellers for Water Storage, Detention and Water Quality Treatment	GL33	Rinaldi	SFWMD	1997	1999	100,000,000	3,100,000	110
Rotenberger/Holey Land Wildlife Management Areas	GL34	Hicks	FDEP	1984	END	16,200,662	11,650,838	111
Stormwater Treatment Areas 1-West and 2 through 6	GL35	Rinaldi	SFWMD	1994	2001	118,148,534	87,963,859	112
Technical Assistance to EAA and C-139 Basin	GL36	Boyd	NRCS	1995	2005	17,498,000	3,000,000	113
Monitoring of Organic Soils in the Everglades	GL37	Hendricks	ARS	1997	2011	1,536,403	36,403	114
Soil Survey Update for the Everglades Agricultural Area	GL38	Hendricks	NRCS	1997	2000	1,500,000	0	115
Sustainable Agriculture in the Everglades Agricultural Area	GL39	Miller	ARS	1998	2018	20,000,000	0	116
Development of Diverse Sugarcane Germplasm and its use in Development of Improved Varieties	GL40	Miller	ARS	1990	2010	21,250,000	6,550,000	117
Lake Okeechobee Demonstration ASR Project	GL41	Devillon	SFWMD	2000	2002	5,500,000	0	118
Cayo Costa Island	GL47	I Barnett	FDEP	1980	END	24,445,539	20,760,877	119
Charlotte Harbor Flatwoods	GL48	I Barnett	FDEP	1992	END	35,037,868	10,244,440	120
Ding Darling National Wildlife Refuge Complex	GL49	Johnson	USFWS	1997	END	6,027,500	0	121
WCA-3A West Hydropattern Restoration	GL52	Hornung	USACE	2000	2003	1,700,000	0	122
Seminole Tribe Best Management Practices for the Brighton Reservation	GL53	Tepper	Seminoles	1998	2004	418,000	80,000	123
Seminole Tribe Comprehensive Surface Water Management System for the Brighton Reservation	GL54	Tepper	Seminoles	1998	2010	15,818,000	150,000	124
Palm Beach Co Water Utilities	GL55	Demian	PBCo.	1997	2001	16,000,000	11,000,000	125
Floridan Aquifer Restoration	GL56	Smith	NRCS	1998	2002	1,200,000	100,000	126
Urban Mobile Irrigation Lab	GL57	Smith	NRCS	1997	2011	1,508,000	1,688,000	127
Caloosahatchee River	GL58	Dawdy	SFWMD	1997	2005	204,350,000	500,000	128
Stock Structure and Abundance of Bottlenose Dolphins along Florida's West Coast	GL59	Swartz	NMFS	1990	2000	296,717	132,000	129
Fish Abnormalities as Environmental Quality Indicators in the St. Lucie - Lower Indian River	GL60	Browder	NMFS	1996	END	100,000	9,200	130

	Project ID No.	PPM	Lead Organization	Start	End	Financial Requirement	Appropriated to Date	Page
Charlotte Harbor National Estuary Program	GL61	Lutterman	USEPA	1996	END	3,707,000	1,460,000	131
Seagrass Studies in Indian River Lagoon	GL62	Kenworthy	NMFS	1987	END	554,400	218,000	132
Subtotal for Greater Lake Okeechoobee:						**2,148,046,499**	**485,158,967**	
Central Everglades								
WCA-2A Regulation Schedule Review	CE01	Brooks-Hall	USACE	1998	2000	500,000	0	143
Water Conservation Areas: Inholdings, Mineral Rights, and Other Interests	CE02	Rinaldi	SFWMD	1948	2010	18,028,792	9,228,792	144
Soil Survey for Everglades National Park& Water Conservation Areas	CE05	Hendricks	NRCS	1997	2002	4,280,000	0	145
Canal C-111 Project	CE06	Landers	USACE	1994	2005	161,293,000	94,080,000	146
East Cape and Homestead Canal Plugs Repair	CE07	Ring	USACE	1997	1997	374,000	235,000	147
Everglades National Park Water & Wastewater	CE08	Ring	NPS	1997	TBD	38,491,000	354,000	148
Hole-in-the-Donut	CE09	Norland	NPS	1994	2017	75,000,000	5,839,129	149
Modified Water Deliveries to Everglades National Park	CE10	Ring	ENP	1990	2006	131,500,000	37,576,000	150
Additional Lands - 8.5 Square Mile Area	CE11	Outland	FDEP	1998	end	76,000,000	0	151
East Everglades Addition to Everglades National Park	CE12	Ring	NPS	1997	2000	106,060,000	61,150,000	152
Experimental Program of Modified Water Deliveries to ENP	CE13	Landers	USACE	1985	2006	0	0	153
Nutrient Threshold/dosing	CE15	Fontaine	SFWMD	1994	2001	13,000,000	10,000,000	154
South Dade Wetlands	CE17	Rinaldi	SFWMD	1994	2007	34,900,000	22,450,000	155
Six Water Level Meteorological Stations	CE18	Woolmam	FDEP	1998	2003	1,076,000	0	156
C-111 Basin Hydrologic Investigations and Model Department	CE19	Graham Generaux	UF/FIU	1998	2001	2,040,600	0	157
Restoration of pineland and hardwood hammocks on previously rock plowed land in C-111 Basin in Dade County	CE21	Pybas	IFAS	1997	2001	1,200,000	0	158
Extension/Public Information to Support Ecosystem Restoration in C-111 Basin	CE23	Pytras	UF/IFAS	1997	2001	1,508,850	0	159
Grossman Hammock Restoration	CE24	DeVries	ENP	1998	2000	100,000	100,000	160
West Dade Wastewater Reuse Study	CE25	Landers	USACE	1997	1999	100,000	0	161
Exotic Plant Control and Restoration of Degraded Plant Communities	CE26	Coughlin	GFWFC	1998	1998	424,000	424,000	162
Tree island Restoration Everglades Mgt Area	CE27	Coughlin	GFWFC	1997	2003	710,000	108,000	163
Everglades Landscape and Everglades Water Quality Model Development	CE29	Fontaine	SFWMD	1994	2001	5,000,000	2,400,000	164
Everglades Tree Island Research and Monitoring Initiative: Phase 1	CE30	Sklar	SFWMD	1997	1999	169,751	83,900	165
Inventory of Tree Islands in WCAs 2 and 3	CE31	Heisler	FGFWFC	1997	2002	383,200	75,400	166
Phosphorous Monitoring at Loxahatchee NWR	CE34	Jewell	USFWS	1992	end	13,000	78,000	167
Exotic Plant Control on Loxahatchee National Wildlife Refuge	CE35	Jewell	USFWS	1992	end	205,000	817,500	168
Miccosukee Tribe Water Management Area	CE36	Duncan	Miccosukee	1997	2002	42,113,000	0	169
Miccosukee Tribe Water Management	CE37	Duncan	Miccosukee	1997	end	25,200,000	199,000	170

	Project ID No.	PPM	Lead Organization	Start	End	Financial Requirement	Appropriated to Date	Page
Subregional characterization of the geological framework of the subsurface coarse sand zone and its influence on Florida Bay and the southern Florida ecosystem	CE38	Scott	FDEP	1998	2000	300,000	0	171
L-28 Modification Project	CE39	Brooks-Hall	USACE	1995	2000	4,750,000	0	172
Nutrient Threshold/Dosing Studies for ENP & Loxahatchee National Wildlife Refuge	CE 40	Johnson	NPS	1997	2001	3,800,000	3,000,000	173
Subtotal for Central Everglades:						**748,520,193**	**248,198,721**	
Southeast Coast								
Homestead Air Reserve Base Realignment and Closure	SE01	Harvey	DOD	1997	2003	0	31,000,000	181
S-26 Salinity Control Structure Repair	SE02	Landers	USACE	1998	2000	526,000	123,000	182
Stormwater Treatment Area 1-East	SE03	Rinaldi	SFWMD	1995	2002	46,682,146	0	183
Barnacle Addition	SE04	Outland	FDEP	1997	end	3,464,000	0	184
East Coast Buffer/Water Preserve Areas	SE05	Jackson	SFWMD	1994	1999	314,400,000	80,000,000	185
South Biscayne Bay Watershed Management Plan	SE06	Rawlinson	Dade	1998	2000	3,400,000	1,700,000	186
Freshwater Lake Belts EIS	SE07	Barron	USACE	1996	1997	0	0	187
Establishing BMPs for Agricultural and Urban Areas of the Eastern C-111 Basin	SE10	Klassen	IFAS	1997	2002	17,690,000	0	188
Agriculture and Rural Land Retention Study	SE11	Rawlinson	SFWMD	1997	1999	950,000	400,000	189
Hillsboro Pilot ASR Project	SE14	Devillion	SFWMD	1997	1999	6,000,000	0	190
North Fork of the New River Restoration	SE15	Schaufele	Broward	1997	1999	570,000	237,000	191
L31E Flow Redistribution Project	SE17	Alleman	SFWMD	1997	end	2,800,000	0	192
Lake Worth Lagoon Restoration	SE19	Barry	SFWMD	1997	2000	2,000,000	0	193
Eastward Ho! Corridor Rival Development Trends Fiscal Impact Analysis (DCA)	SE20	Mofson	DCA	1997	1998	150,000	150,000	194
East Coast Canal Structures: C-4 and C-6	SE21	Marban	SFWMD	1997	1999	3,750,000	0	195
Dade County Archipelago	SE26	Outland	FDEP	1997	1999	42,500,000	30,474,325	196
South Dade Wetlands Addition	SE27	Frost	NPS	1997	TBD	35,000,000	0	197
Biscayne Bay Feasibility Study	SE28	Brooks-Hall	USACE	1997	2004	5,590,000	1,056,000	198
Comprehensive Water Quality Standards for Biscayne Bay	SE29	Frost	NPS	1997	1999	350,000	0	199
Ground-Water Quality Discharge Standards	SE32	Frost/Curry	FDEP	1997	1999	750,000	0	200
Ground-Water Quality in Coastal Environments	SE33	Frost/Curry	FDEP	1997	1999	400,000	0	201
Surface Water Management Master Plan for the former Homestead Air Force Base	SE34	Hernandez	SFWMD			0	0	202
New River Forest Restoration Project	SE35	Myers	BC DNRP	1997	2005	2,220,000	220,000	203
Stock Structure and Abundance of Bottlenose Dolphins in Biscayne Bay	SE36	Swartz	NMFS	1990	2000	160,000	70,000	204
Dade County Environmentally Endangered Lands Program	SE37	Young	Dade Co.	1991	TBD	99,383,000	62,650,000	205
Military Canal Remediation	SE38	Frost	NPS	1997		0	0	206

	Project ID No.	PPM	Lead Organization	Start	End	Financial Requirement	Appropriated to Date	Page
Biscayne Bay Ecosystem Restoration Assessment	SE39	Frost	NPS	1998	2001	1,200,000	0	207
Cumulative Effects of Natural and Anthropogenic Stressors	SE40	Goodyear	NOAA	1995	2001	6,250,000	2,650,000	209
Western Water Quality Treatment Project	SE41	Dollar	USACE	1997	2002	8,600,000	0	210
Subtotal for Southeast Urban & Coastal Areas:						**604,785,146**	**210,730,325**	
Southwest/Big Cypress								
Additional Water Conveyance Structures Under Tamiami Trail	SW01	Hibbard	NPS	1998	2002	15,000,000	0	218
Seminole Tribe Water Conservation Project for Big Cypress	SW03	Tepper	Seminoles	1998	2002	48,307,000	0	220
Belle Meade Land Acquisition	SW04	I Barnett	FDEP	1997	1999	33,726,136	10,916,425	222
Big Cypress National Preserve Addition	SW05	Hibbard	NPS	1998	2001	30,320,000	18,520,000	223
Big Cypress National Preserve Mineral Rights	SW06	Hibbard	NPS			0	0	224
Big Cypress National Preserve Private Inholdings	SW07	Hibbard	NPS		2001	165,261,364	154,561,364	225
Corkscrew Regional Ecosystem Watershed	SW08	Rinaldi	SFWMD	1995	2002	34,800,000	30,400,000	226
Fakahatchee Strand	SW09	I Barnett	FDEP	1997	1999	23,310,945	19,044,116	227
Southern Golden Gate Estates Hydrological Restoration	SW10	Nath	FDEP	1998	2005	52,312,000	9,112,000	228
Land Adjacent to Dade County Training Jetport	SW11	Hibbard	NPS			0	0	230
Southern CREW Project Addition/Imperial River Flowways	SW12	Merriam	SFWMD	1997	2001	18,000,000	2,500,000	231
Twelve Mile Slough	SW13	Rinaldi	SFWMD	1998	2001	3,300,000	3,300,000	233
Seminole Tribe Best Management Practices for the Big Cypress Reservation	SW14	Tepper	Seminoles	1996	1999	4,779,000	0	234
Seminole Tribe Exotic Species Removal	SW15	Tepper	Seminoles	1998	2010	1,064,000	76,000	235
Picayune Strand State Forest Exotic Species Management	SW16	Folks	FDACS	1998	2010	24,914,000	0	236
Assimilative Capacity for Phosphorus of C&SF Canals on the Big Cypress Reservation	SW17	Tepper	Seminoles	1998	2004	550,000	50,000	237
Nutrient Threshold Work for Cypress	SW18	Tepper	Seminoles	1998	2004	470,000	100,000	238
Impacts of Sludge Deposition on Phosphorus Levels on the Big Cypress Reservation	SW19	Tepper	Seminoles	1998	1998	50,000	0	239
Melaleuca Control (Critical)	SW20	Hibbard	NPS	1998	2005	1,400,000	700,000	240
Subsurface Sand Body Investigation (Sunniland)	SW22	Scott	FDEP	1996	1997	10,000	10,000	241
Southwest Surficial Aquifer System Investigation	SW23	Scott	FDEP	1997	1998	60,000	60,000	242
Henderson Creek/Belle Meade Restoration	SW24	Haner	FDEP	1997	2002	5,140,000	3,940,000	243
Lake Trafford Restoration	SW26	I Barnett	FDEP	1998	2002	8,243,000	43,000	245
Estero Bay	SW28	I Barnett	FDEP	1985	end	20,784,050	7,973,750	247
Lake Park Restoration Project	SW29	I Barnett	FDEP	1997	2003	5,000,000	2,541,000	248
Town Of Ft.Myers Beach Storm Water Retrofit	SW30	I Barnett	FDEP	1998	2000	120,000	0	249
Rookery Bay	SW31	I Barnett	FDEP	1997	1998	38,826,750	31,355,418	250
Collier Seminole State Park Exotic Removal Project	SW33	Henry	FDEP	1998	2000	808,000	404,000	251
Fakahatchee Strand State Preserve Exotic Removal Project	SW34	Toppin	FDEP	1998	2001	200,000	0	252
Estero Bay Aquatic Preserve and Buffer Reserve Enhancement and Exotic Removal Project	SW35	Stafford	FDEP	1998	2004	1,365,000	35,892	253

	Project ID No.	PPM	Lead Organization	Start	End	Financial Requirement	Appropriated to Date	Page
Long-term Study of Fire Regimes in Pineland and Associated Cypress Wetlands	SW36	Snyder	USGS/BRD	1994	2002	660,000	141,000	254
Strand Structure and Productivity of Short-hydroperiod Graminoid Wetlands	SW37	Snyder	USGS/BRD	1998	2001	470,000	0	255
Aquatic Animal Dynamics in Big Cypress Habitats	SW38	Loftus	USGS/BRD	1998	2003	210,000	0	256
Seminole Critical Project for the West side of the Big Cypress Water Conservation Project	SW39	Tepper	Seminoles	1998	2002	23,452,000	0	257
Plant Biodiversity of Big Cypress National Preserve	SW40	Snyder	USGS/BRD	1998	1999	48,000	0	259
Hydrologic Reconnaissance of the gray limestone aquifer of South Florida	SW41	Reese	USGS/BRD	1996	1999	756,000	323,600	260
Investigation of Kemp's Ridley Turtles (Lepidochelys kemp) in the Coastal Waters of Southwest Florida	SW42	Witzell	NMFS	1997	2006	750,000	75,000	261
Strataphy and hydrogeology of the surficial aquifer system of Southwest Florida	SW43	Weedman	USGS	1996	1999	866,045	481,259	262
Okaloacoochee Slough	SW44	Rinaldi	SFWMD	1998	2001	16,277,060	16,277,060	263
Subtotal Southwest/Big Cypress:						**581,610,350**	**312,940,884**	
Florida Keys								
Complete Land Acquisition for Biscayne National Park	FK02	Frost	NPS	1998	2000	6,100,000	0	272
Complete Crocodile Lake National Wildlife Refuge	FK03	Steiglitz	USFWS	1998	2000	786,000	400,000	273
Complete Florida Keys Ecosystem CARL Project	FK05	Outland	FDEP	1992	END	36,793,484	27,174,425	274
Complete Key Deer National Wildlife Refuge	FK06	Steiglitz	USFWS	1997	2001	14,000,000	0	275
Complete North Key Largo Hammocks State Botanical Site	FK07	Outland	USFWS	1983	END	73,733,875	71,000,034	276
Florida Keys Carrying Capacity Study	FK14	Pattison	DCA	1998	2001	6,000,000	500,000	277
Florida Keys Nutrient Feasibility Study	FK15	Teague	DOH	1996	1998	1,060,000	1,060,000	278
Florida Keys Stormwater Master Plan	FK16	Garrett	Monroe	1997	2001	2,000,000	100,000	279
Florida Keys Sanitary Wastewater Master Plan	FK17	Garrett	DCA	1997	1999	2,200,146	1,624,970	280
Florida Keys National Marine Sanctuary Water Quality Protection Program	FK18	McManus	EPA	1995	1999	5,800,000	3,475,200	281
Marathon Community Wastewater Treatment Plant	FK19	Garrett	Monroe	2000	2004	70,000,000	314,000	282
Florida Keys Cesspit Identification and Ilimination Program – Administrative	FK21	Teague	FDEP	1997	END	1,000,000	1,000,000	283
Florida Keys Tidal Creek Restoration Project	FK28	Hebling	FDEP	1998	2000	1,224,000	250,000	285
Florida Keys Cesspit Identification and Elimination Program - Financial Assistance to Citizens	FK29	Braun	Monroe	1997	2007	2,200,000	1,200,000	286
Florida Keys Channel Marking Master Plan (Monroe County)	FK30	Garrett	Monroe	1997	2002	620,000	70,000	288
Florida Keys Invasive Exotic Plant Control Stratergy	FK31	Steiglitz	USFWS	1998	2000	4,190,000	0	289
Florida Keys Multi-Species Habitat Conservation Plan	FK32	Symroski	FDCA	1999	2000	250,000	0	290
Florida Keys NMS: Level I Monitoring of Ecosystem Structure and Function	FK33	Haskell	NOAA	1997	2002	1,100,000	200,000	291

	Project ID No.	PPM	Lead Organization	Start	End	Financial Requirement	Appropriated to Date	Page
Florida Keys NMS: Level II Sentinel Fisheries Program	FK34	Haskell	NOAA	1997	2002	128,000	18,000	292
Florida Keys NMS: Level II Monitoring for Lobster/Conch	FK35	Haskell	NOAA	1997	2002	195,000	30,000	293
Florida Keys NMS: Level II Rapid Assessment	FK36	Haskell	NOAA	1997	2002	200,000	40,000	294
Florida Keys NMS: Level II Human Activities Assessment	FK37	Haskell	NOAA	1997	2002	1,050,000	50,000	295
Florida Keys NMS: Level II Monitoring of Sea Grass	FK38	Haskell	NOAA	1997	2002	60,000	20,000	296
Florida Keys NMS: Level III Volunteer Benthic Monitoring	FK39	Haskell	NOAA	1997	2002	100,000	20,000	297
Florida Keys NMS: Level III Rapid Response	FK40	Haskell	NOAA	1997	2002	300,000	20,000	298
Florida Keys NMS: Level III Fish Survey	FK41	Haskell	NOAA	1997	2002	64,000	12,000	299
Team Ocean	FK42	Tagliarini	NOAA	1997	2001	680,000	40,000	300
Coral Reef Classroom	FK43	Kelly	NOAA	1997	2001	110,320	20,515	301
Subtotal for Florida Keys:						**231,944,825**	**108,639,144**	
Grand Total all Subregions:						**5,268,134,278**	**1,612,088,336**	

3.1 *THE TOTAL SYSTEM*
Kissimmee through the Keys

ECOLOGICAL SETTING

The South Florida ecosystem encompasses an area of approximately 18,000 square miles extending from Orlando to the reef tract in the Keys and the Gulf of Mexico to the Atlantic Ocean. It is a system dominated by the watersheds of the Kissimmee River, Lake Okeechobee, and the Everglades. Interconnected by water, the system functions as an integral mosaic of wetlands, uplands, coastal and marine areas.

Prior to drainage and development in the late 1800s, wetlands dominated the landscape. That landscape consisted of swamp forest; sawgrass plains; mosaics of sawgrass, tree islands, and ponds; wet prairies; cypress strands; pine rocklands; hardwood hammocks; and other subtropical landforms. .

ECOSYSTEM PROBLEMS AND RESTORATION OBJECTIVES

Beginning with channelization of the Caloosahatchee River and its connection to Lake Okeechobee, and culminating with construction of the Central and Southern Florida Project (C&SF) authorized by Congress in 1948, the system was forever altered. Drainage fostered development, which, in turn, required more drainage to protect against flooding. Flood control made possible massive land-use changes that decreased the availability of land for water storage and recharge and altered both the direction and rate of runoff. Today, the hydrology of South Florida is vastly changed from what it was prior to the 1800s. Changes in the hydrologic regime directly and indirectly caused other physical and biological changes.

The first annual report of the Interagency Working Group (1994) highlighted ecosystem problems that now exist and generically describes an overall approach to restoration. Major ecosystem problems identified in that annual report include:

- Diminished floodplain habitat diversity, reduction of wading birds, fishery forage.
- Nutrients in water.
- Soil subsidence.
- Spread of exotic animal and plant species.
- Altered hydroperiods.
- Uncoupling of wetlands and estuaries from rainfall.
- Loss of hydraulic head and recharge.
- Mercury contamination of water.
- Fire regime changes.

The ideal conceptual restoration target for South Florida is re-establishment of pre-drainage topography, hydrology, and vegetative cover. “In reality, the irreversible loss of significant wetland areas, as well as the almost complete urbanization of the East Coast ridge and the need to accommodate agriculture make the restoration target only approachable.” (1994 Annual Report, Interagency Working Group).

RESTORATION OBJECTIVES:

The restoration objectives of critical importance for the Total System have been identified by the working group and are listed as follows:

- Maximize the system’s spatial extent and hydrologic interconnection.
- Reestablish natural hydrologic functions.

- Decompartmentalize Water Conservation Areas (WCA's).
- Recover threatened and endangered species.
- Restore natural biological diversity and natural vegetation communities.
- Halt and reverse the invasion of exotic plants and animals.
- Reestablish sustainable wading bird populations and colonies.
- Reestablish wildlife corridors.
- Evolve current agriculture to be compatible with the natural hydrologic regime.
- Promote water conservation.
- Prevent point source and non-point source pollution.
- Restore natural estuarine and coastal productivity.
- Increase hard coral cover on reefs.
- Implement best urban and agricultural management practices to improve water quality and reduce water consumption.
- Link Agricultural and urban growth management with ecosystem management.
- Minimize groundwater seepage.

RESTORATION PROJECTS

Important restoration projects in progress or proposed for the Total System are identified on the following pages:

TITLE: C&SF Project Comprehensive Review Feasibility Study			
SUBREGION : Total System	***PROJECT ID:*** TS01	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Infra Invest	USACE - $9,977,000 SFWMD - $9,977,000	
PROJECT PLAN MANAGER: Mike Ornella, 904-232-1600	***BASIS:*** 1	***TOTAL:*** $19,955,000	
LEAD ORGANIZATION(S): USACE		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): SFWMD		USACE - $7,243,000 SFWMD - $5,892,000	
COUNTY(S): SFWMD Boundaries		***TOTAL:*** $13,135,000	
LINKED PROJECTS: **Dependent on:** **Critical to :** **Associated with:** CE01,CE04, CE13, GL01, GL03, GL19, GL52, GL30, SE07, SE28,		***REMAINING FINANCIAL REQUIREMENT:*** USACE - $2,734,000 SFWMD - $4,085,000 ***TOTAL:*** $6,819,000	
START: 1997	***END:*** 2004	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The Central and Southern Florida (C&SF) Project was authorized in 1948. Since that time, 13 additional Congressional authorizations have modified the project. The Comprehensive Review Study (Restudy) is the first comprehensive review of the entire project. The study is addressing the long-term water resources needs of South Florida with a view toward enhancing the region's natural resources while maintaining or enhancing other authorized project purposes. The Restudy will be accomplished through a series of interim reports. WRDA 96 requires that a report recommending a Comprehensive Plan be submitted to Congress in August 1999, along with a Programmatic EIS. More detailed studies will be continued after the report is submitted. The Water Preserve Areas and L-28 Modification studies are being performed as a component of this study and its costs are included in this estimate.

RESTORATION BENEFITS: This study will develop a comprehensive plan for the entire project and will provide more detailed plans for the creation of water preserve areas in the east coast buffer strip area. The scope of work and plan of study is documented in a Project Study Plan dated May 1997. The studies will focus on restoring hydrologic conditions in South Florida's natural areas for the purpose of restoring historic patterns of diversity and abundance of native species of flora and fauna. At the same time opportunities to protect and enhance authorized project purposes of water supply and flood control will be investigated.

Time Line and Fiscal Year Budget (in thousands of dollars) for C&SF Project Comprehensive Review Study

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Comprehensive Plan	■	■	■													
Water Preserve Areas Study	■	■	■	■	■	■										
L-28 Modification Study	■	■														
Project																
USACE		2814	1088	904	656	86										5548
SFWMD		2995	1846	1521	611	107										7080
																$12,628

TITLE: Manatee Protection Gate Modifications			
SUBREGION : Total System	***PROJECT ID:*** TS02	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Infra Invest	USACE $7,609,000 SFWMD $1,558,000	
PROJECT PLAN MANAGER: Melissa Dollar, 904-232-3848	***BASIS:*** 2	***TOTAL:*** $9,170,000	
LEAD ORGANIZATION(S): USACE		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): USFWS, DEP, SFWMD			
COUNTY(S): Charlotte, Glades, Martin, St Lucie, Palm Beach, Broward, Dade		***TOTAL:*** $1,500,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** TS19 **Associated with:**		***REMAINING FINANCIAL REQUIREMENT:*** ***TOTAL:*** $7,670,000	
START: 1997	***END:*** 2000	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Project Modification Reports (Parts 1 & 2) recommending modifications to 27 locks and water control structures in the Central and Southern Florida (C&SF) Project have been prepared and approved. Manatee mortality associated with the operations of the structures is a substantial problem. It is second in numbers only to manatee mortalities caused by boat collisions. Implementation will be on an incremental basis to allow for testing and refinement of the modifications during the process.

RESTORATION BENEFITS: The purpose of the modifications is to avoid or minimize manatee mortality caused by the operation of C&SF Project structures and locks. The Florida manatee is listed as an endangered species by the U.S. Fish and Wildlife Service. The proposed modifications would substantially reduce the second largest cause of manatee mortality and, therefore, would be instrumental in recovery of the species. The project implementation plan is being internally reviewed by the Corps. Testing of a mechanical sensing device will be complete in June 1996. Testing of an acoustic sensing device will be complete in September 1996. At that time, with approval of the Corps, implementation could be initiated. Construction is scheduled to be completed in FY2000.

Time Line and Fiscal Year Budget (in thousands of dollars) for Manatee Protection Gate Modifications																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
	1509	1812	3261	2586												9,170
Subtotal																**$9,170**

TITLE: Melaleuca Quarantine Facility			
SUBREGION : Total System	***PROJECT ID:*** TS03	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Infra. Investment	USDA $5,000,000	
PROJECT PLAN MANAGER: Ted Center (954) 475-0541	BASIS***:*** 2	***TOTAL:*** $5,000,000	
LEAD ORGANIZATION(S): ARS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): USACE			
COUNTY(S): All		***TOTAL:*** $1,000,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** TS01 **Associated with:** TS11, TS12		***TOTAL:*** $4,000,000	
Start: 1997	***END:*** 2000	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The project consists of constructing a quarantine facility to enable the testing of candidate organisms for biological control and reversal of the spread of exotic plant species, particularly melaleuca, in South Florida. The facility would be constructed on the University of Florida campus in Davie by the Corps and then turned over to the USDA for operation. Melaleuca trees are rapidly invading the natural Everglades habitat. Their growth is so dense that the typical characteristics of native habitat us completely destroyed. They currently are spreading at such a rapid rate, they represent a threat to the Everglades that is comparable to the problems of altered water conditions. There is an immediate need to test several insects identified in Australia as potential control agents. Currently, many Federal, State, and local agencies are devoting substantial resources and funding to conventional control, but biological techniques may be both more economical and more effective.

RESTORATION BENEFITS: Biological control agents have the potential of providing greater efficiency and improved economy. Ultimately, they may prove to be the only truly effective large-scale means of reversing and halting the effects of non-native species on the South Florida habitat.

Time Line and Fiscal Year Budget (in thousands of dollars) for Melaleuca Quarantine Facility																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Construction																
Project																
ARS	1,000	1800	700	500												4,000
Subtotal																**$4,000**

TITLE: Agriculture Land Stewardship			
SUBREGION : Total System	***PROJECT ID:*** TS04	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Natural Resource management	USDA	
PROJECT PLAN MANAGER: Smola (561) 686 8800x2857	***BASIS:*** 2	***TOTAL***: $10,920,000	
LEAD ORGANIZATION(S): NRCS – DACS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): ERS, IFAS, FDEP			
COUNTY(S): All		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** TS05, TS22, TS26, TS27 **Associated with:** TS06, TS10, TS17, TS21, TS25, TS29		***TOTAL:*** $10,920,000	
START: 1997	***END:*** 2008	***APPROVED:*** 11/97	***LAST REVISION*: 2/98**

DESCRIPTION: Assist the Florida Departments of Agriculture and Consumers Services, Commerce and Environmental Protection in developing incentives targeting farming operations that address sound land stewardship. 1) Whole Conservation Planning - A programs approach to meet environmental regulatory goals on private lands through delivery of conservation technical assistance and planning with landowners on a voluntary basis. 2) Team Agricultural Permitting - Procedures developed that allows State, regional, and local regulatory authorities to execute agreements and memorandums that will expedite and improve the agricultural permitting process for landowners/operators. 3) Development Rights Program for Agriculture - A cooperative program with the Florida DACS that will encourage local governments to pursue where applicable, purchase and transfer of development rights for agriculture land. 4) - Green Labeling - An Agricultural products labeling and marketing system that identifies farm products that have been grown, harvested, transported, processed and delivered to the grocery shelf which exceed minimum quality requirements established. These quality requirements will begin with on farm land stewardship practices and management procedures that ensure the public that these products have been produced without harming the local environment.

RESTORATION BENEFITS: Through these initiatives and incentives, agricultural producers will be more willing to participate, accept and implement state of the science technology and marketing procedures. These benefits will allow for a viable agricultural economy to function within the region, while not adversely impacting the Everglades ecosystem restoration efforts or its long -term sustainability.

Time Line and Fiscal Year Budget (in thousands of dollars) for Agriculture Land Stewardship																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
NRCS	300	300	300	300	300	300	300	300	300	300	300	300				3,600
DACS	300	300	300	300	300	300	300	300	300	300	300	300				3,600
ERS	10	10	10	10	10	10	10	10	10	10	10	10				120
IFAS	300	300	300	300	300	300	300	300	300	300	300	300				3,600
Subtotal																**$10,920**

TITLE: BMPs for Agriculture			
SUBREGION : Total System	***PROJECT ID:*** TS05	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Natural Resource Management	USDA $32,050,000	
PROJECT PLAN MANAGER: Greg Hendricks (561) 795-5451	***BASIS:*** 3	***TOTAL:*** $32,050,000	
LEAD ORGANIZATION(S): NRCS		***APPROPRIATED TO DATE:*** USDA $4,000,000	
SUPPORTING ORGANIZATION(S): IFAS/ES, ARS, ERS, CSREES			
COUNTY(S): All		***TOTAL:*** $4,000,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:**		USDA 28,050,000	
Critical to:	TS04, TS24, TS26, TS27, TS22		
Associated with:	TS25, TS29	***TOTAL:*** 28,050,000	
START: 1997	***END:*** 2007	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: In cooperation and coordination with the Florida Department of Environmental Protection, the South Florida Water Management District, and other agencies as appropriate, NRCS will provide technical assistance to landowners and managers that will encourage the adoption of Best Management Practices (BMPs) into sustainable agricultural resource management systems. Barriers to adoption of BMPs will be determined and the effectiveness of incentives for adoption assessed. Landowners will integrate the latest technology and management techniques as a part of a dynamic resource management plan incorporating all aspects of their routine land management functions.

1. Develop Resource Management Plans - Develop practical agricultural resource management plans on all lands purchased as part of ecosystem restoration.

2. Farm-level economic and environmental impacts of BMPs will be characterized with respect to crop choices, water and chemical management, and economic costs and returns. The impacts of restoration options on farmers' choices of agricultural practices and changes in profitability will be estimated for each area. The effectiveness of the use of BMPs and incentives to encourage the adoption of practices to enhance water and nutrient flows will be assessed.

3. Technical Assistance to Beef Cattle Operators - Accelerate technical assistance to beef cattle operators to assure these landowners have the necessary information and guidance to meet State water quality standards.

RESTORATION BENEFITS: Through these initiatives agricultural and beef cattle landowners/operators will be given the necessary tools and technology to manage their lands, as well as those publicly acquired, for ecosystem restoration in a more environmentally friendly manner. Resource management plans developed with farmers/ranchers will meet their primary agricultural objectives while at the same time meeting all State, Federal and local environmental regulations and rules. Through the application of this technical assistance and conservation planning program agriculture will function economically and socially within the region, while not adversely impacting the Everglades ecosystem restoration efforts. Through these efforts agricultural lands will provide benefits and values to a restored south Florida ecology as a nutrient and pollution buffer between urban and natural areas, landscape diversity and wildlife habitat and corridors.

Time Line and Fiscal Year Budget (in thousands of dollars) for BMPs for Agriculture																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
NRCS-funded	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000					20,000
NRCS-unfunded	1000	1000	1000	1000	1000	1000	1000	100	1000	1000	1000					10,000
IFAS-unfunded	175	175	175	175	175	175	175	175	175	175	175					1,750
ERS-unfunded	20	20	20	20	20	20	20	20	20	20	20					200
ARS-unfunded	10	10	10	10	10	10	10	10	10	10	10					100
Subtotal																**$32,050**

TITLE: Economic Analysis of Agricultural Land and Water Management			
SUBREGION : Total System	***PROJECT ID:*** TS10	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Natural Resource Management	USDA $1,845,000	
PROJECT PLAN MANAGER: Caswell (202) 219-0507	***BASIS:*** 2	***TOTAL:*** $1,845,000	
LEAD ORGANIZATION(S): USDA- ERS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): NRCS, ARS, IFAS/ES			
COUNTY(S): All		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:**			
Critical to : TS1,TS4, TS5, TS26, TS27			
Associated with: TS25, TS29		***TOTAL*** : $1,845,000	
START: 1997	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Economic analysis of regional agricultural activities as part of Everglades ecosystem restoration program. Assessments of allocations of land and water resources between agriculture, urban development and environmental services. Characterization of impacts of structural and non-structural options on land use, cropping patterns, water and chemical management, and the regional economy. Structural options could include canals, pumps, or reservoirs. Non-structural restoration policies could include easements, transfer of development rights or land acquisition. Estimation of economic trade-offs to agricultural producers, urban development, and environmental uses associated with land and water -use options and cropping practices.

RESTORATION BENEFITS: This project will contribute to the design of cost-effective policies to increase both the quantity and quality of water flowing to the Everglades ecosystem. Impacts on the agricultural sector and the regional economy of land retirement policies, water storage structures, and land-use changes will be available to decision makers.

Time Line and Fiscal Year Budget (in thousands of dollars) for Economic Analysis of Agricultural Land and Water Management

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
ERS	100	200	300	250	250	200										1300
NRCS	50	55	60	65	65											295
IFAS/ES	50	50	50	50	50											250
Subtotal																**$1,845**

TITLE: Exotic Pest Plant Controls in South Florida Ecosystems			
SUBREGION : Total System	***PROJECT ID:*** TS11	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Water Quality, Habitat Protection/ Restoration Research	USDA: $7,307,000	
PROJECT PLAN MANAGER: Center (954) 475-0541	***BASIS:*** 1	***TOTAL:*** $7,307,000	
LEAD ORGANIZATION(S): ARS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): IFAS/ES, NRCS, USFS			
COUNTY(S): **All**		***TOTAL:*** $2,547,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:**			
Critical to: TS01, TS03, TS14, TS27, TS61			
Associated with: TS4, TS5		***TOTAL:*** $4,750,000	
START: 1998	***END:*** 2006	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Assist in developing and enacting mitigation requirements that encourage fast removal of melaleuca and other exotic pest plants from private property (Governor's Commission Recommendation Nos. 42, and 44). Management strategies and biological control agents will be developed that are efficient, economical, and environmentally safe. Biological control agents will be mass-reared or collected and re-distributed throughout infested areas or provided to appropriate resource managers for distribution. This involves quarantine isolation to exclude parasites and diseases (requiring quarantine facilities) of insects introduced to control melaleuca and other invasive plant species that hamper restoration efforts; release and establishment of biological control agents integrated into management systems for melaleuca and other invasive plants; evaluation of biological control efficacy in conjunction with broader overall studies on the autecology of invasive weeds, particularly as this pertains to effects of weed invasions on ecosystem functioning; and development of methods to establish or encourage replacement native plant species in area where invasive species have been removed or suppressed.

RESTORATION BENEFITS: The project will provide research and biological control agents essential to the suppression of invasive noxious plants that displace native species in restored ecosystems thereby thwarting restoration efforts; will assist in the re-establishment of diverse native plant communities and provide information critical to the development of incentives that encourage removal or replacement of invasive species on private properties that serve as staging areas for invasions into restored ecosystems.

Time Line and Fiscal Year Budget (in thousands of dollars) for Exotic Pest Plant Controls in South Florida Ecosystems

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
IFAS		60	60	60	60	60	60	60	60	60						540
ARS		783	783	783	783	783	783	783	783	283						6,547
NRCS		15	15	15	15	15	15	15	15	10						130
FS		10	10	10	10	10	10	10	10	10						90
Subtotal																**$7,307**

TITLE: Fire Management Plans for Public Lands			
SUBREGION : Total System	***PROJECT ID:*** TS13	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:***	FDEP $1,300,000 DOI $1,300,000	
PROJECT PLAN MANAGER: John Folks (850)414-9928	***BASIS:*** 3	***TOTAL:*** $2,600,000	
LEAD ORGANIZATION(S): FDACS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): SFWMD, FDEP, NPS, USFWS, BIA, FGFWFC			
COUNTY(S): Total System		***TOTAL:*** 0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** SW04, SW10 **Associated with:** SW09		***TOTAL:*** $2,600,000	
START: 1998	***END:*** 2003	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The FDACS Division of Forestry, with input from the FDEP, FGFWFC, SFWMD, USFWS and BIA and local fire districts, will develop and implement, through their statutory and delegated authority addressing open burning, a Fire Management Plan for public lands. The plan (and associated model) will be based on a holistic, total ecosystem approach that will provide coordinated smoke management and assure prescribed burning will continue as a management tool in restoring and maintaining the fire-based ecosystem of South Florida.

RESTORATION BENEFITS: The plan will provide and assure the use of fire as a management tool; through the reduction of smoke related problems and wildfires, and the use of appropriate seasonal burns, in the restoration and maintenance of the South Florida ecosystem.

Time Line and Fiscal Year Budget (in thousands of dollars) for Fire Management Plans for Public Lands																
Agency	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
FDEP		250	120	120	120	120	120									1300
DOI		250	120	120	120	120	120									1300
Project																
Subtotal		500	420	420	420	420	420									$2,600

TITLE: Florida Greenways System Implementation – Federal Involvement			
SUBREGION : Total System	***PROJECT ID:*** TS14	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Natural Resources Management	**USDA** $366,000	
PROJECT PLAN MANAGER: Debbie Caffin (904) 942-9376	***BASIS:*** 2	***TOTAL:*** $366,000	
		APPROPRIATED TO DATE:	
LEAD ORGANIZATION(S): USFS, FDEP			
SUPPORTING ORGANIZATION(S): NRCS, IFAS/ES, ARS, ERS			
COUNTY(S): All		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:**		**USDA** $366,000	
Critical to: TS04, TS05, TS06			
Associated with:		***TOTAL:*** $366,000	
START: 1997	***END:*** 2010	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Cooperate and communicate with the Florida Greenways Coordinating Council through the U.S. Forest Service and the regional greenways task force federal representatives in all aspects of agency programs: media; land acquisition and exchanges; management techniques; research projects; access; trails; etc. (Governor's Commission Recommendation No. 63).

RESTORATION BENEFITS: Take advantage of the organization which already exists through the Florida Greenways Coordinating Council. Assure a continuity of communications among various agencies and organizations having interests in the restoration of South Florida ecosystems. Other related issues and activities which must be coordinated include Federal/State land acquisition, ecosystem management, mitigation opportunities, land management, public education and involvement, and exotic/invasive weed management.

Time Line and Fiscal Year Budget (in thousands of dollars) for Florida Greenways System Implementation – Federal Involvement

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
NRCS	15	15	15	15	15	15	15	15	15	15	15	15	15	15		210
FS	10	10	10													30
IFAS	5	5	5	5	5	5	5	5	5	5	5	5	5	5		70
ERS	2	2	2	2	2	2	2	2	2	2	2	2	2	2		28
ARS	2	2	2	2	2	2	2	2	2	2	2	2	2	2		28
Subtotal																**$366**

TITLE: Multi-Species Recovery Strategy			
SUBREGION : Total System	***PROJECT ID:*** TS19	***FINANCIAL REQUIREMENT:*** USFWS	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:***		
PROJECT PLAN MANAGER: Johnson (407) 562-3909	***BASIS:***	***TOTAL:*** $8,000,000	
LEAD ORGANIZATION(S): USFWS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): EPA, USACE, USAF, USFS, NPS, NMFS, FGFC, FDEP, counties			
COUNTY(S): All		***TOTAL:*** $0	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***REMAINING FINANCIAL REQUIREMENT:*** ***TOTAL:*** $8,000,000	
START: 1995	***END:*** until complete	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The multi-species recovery strategy will address the recovery needs of all of the federally-listed threatened and endangered species in the South Florida ecosystem. This strategy will be one of the first recovery plans that is specifically designed to meet the needs of multiple species that do not occupy similar habitats. The strategy will provide information to support the design and construction of projects associated with the restoration of the South Florida ecosystem.

RESTORATION BENEFITS: The 68 federally threatened and endangered species in the South Florida Ecosystem are indicators of the health of the ecosystem and its component habitats. There are very few terrestrial or aquatic communities in the South Florida Ecosystem that do not support one or more of these species or are not critical elements of their ecology. The recovery of most of these species will be indicative of the effectiveness of the restoration effort.

Time Line and Fiscal Year Budget (in thousands of dollars) for Multi-Species Recovery Strategy																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Preparation																
Implementation																
Project																
																8,000
Subtotal																**$8,000**

TITLE: Pollution Prevention			
SUBREGION : Total System	***PROJECT ID:*** TS22	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Natural Resources Mgmt.	USDA: $870,000	
PROJECT PLAN MANAGER: Ron Smola 561.686-8800	***BASIS:*** 2	***TOTAL:*** $870,000	
LEAD ORGANIZATION(S): NRCS, FDACS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): IFAS, ARS, ERS			
COUNTY(S): All		***TOTAL:*** 0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** CE20 **Associated with:** SE15, SE19, CE22,		***TOTAL:*** $870,000	
START: 1998	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: In cooperation with the FDEP, FDCA, and the EPA, develop a pollution prevention and control program for the South Florida Ecosystem. This project will target the development of an enhanced urban and agriculture pollution prevention control program through public and private cooperation in the development of best management practices. Expand existing programs such as Farm-A-Syst Program, and develop new and innovative agricultural BMP's. Develop and provide information materials targeted to the urban populace to reduce pollution to the ecosystem. (Governor's Commission recommendation #31.)

RESTORATION BENEFITS: This project will result in a reduction of the release of pollutants to water bodies from urban and rural residences and agricultural producers.

Time Line and Fiscal Year Budget (in thousands of dollars) for Pollution Prevention																
Agency	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
NRCS		100	100	120	120	120										560
IFAS		50	50	50	50	50										250
ARS		10	10	10	10	10										50
ERS		2	2	2	2	2										10
Project																
Subtotal		162	162	182	182	182										$870

TITLE: Supplemental Water Quality Treatment Technology Demonstration Projects			
SUBREGION : Total System	***PROJECT ID:*** TS23	***FINANCIAL REQUIREMENT:*** (Proposed)	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Water Quality and Habitat Protection	State:	
		Federal:	
PROJECT PLAN MANAGER: Aumen (561) 687-6601	***BASIS:*** 2	***TOTAL:*** $10,000,000 (Demonstration projects only**)**	
		APPROPRIATED TO DATE:	
LEAD ORGANIZATION(S): SFWMD, FDEP		State: $ 1,218,350	
SUPPORTING ORGANIZATION(S): USACE, NPS, EPA		Federal: $ 824,000	
COUNTY(S): Palm Beach, Broward, Dade, Hendry, Okeechobee		***TOTAL:*** $ 2,042,350	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:**		State:	
Critical to: GL31, CE06, CE10		Federal:	
Associated with:		***TOTAL:*** $ 7,957,650	
START: 1997	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The purpose of these projects is to demonstrate the feasibility, define design criteria, and estimate long-term costs for a number of candidate water quality treatment technologies for reducing concentrations to levels that will not create adverse effects on (or an imbalance in) natural biological communities in the Everglades ecosystem. Stormwater Treatment Areas (STAs) are being designed to achieve an interim restoration target of 50 ppb phosphorus. Currently, the primary focus of Supplemental Technology projects is on reducing phosphorus concentrations to 10 ppb or less. This program will evaluate water treatment technologies that can be used: 1) as part of a treatment train in conjunction with STAs to reduce phosphorus concentrations below to 10 ppb or less, or 2) as stand-alone water quality treatment facilities. Candidate technologies include, but are not limited to, the following: managed wetlands, low-intensity chemical dosing, submerged aquatic vegetation/limerock, chemical treatment/direct filtration, chemical treatment/high-rate sedimentation, chemical treatment/dissolved-air floatation, microfiltration, and periphyton STAs. Based on recommendations developed by the Governor's Commission and the SFER Working Group, the need for water treatment technologies has been identified for the EAA (e.g., Everglades Program), the ECB/WPA, the Mod Waters Project (e.g., Water Control Structure S-9), the Canal 111 Project (e.g., Water Control Structure S-332), the Big Cypress Basin (Levee 28 Interceptor), the Caloosahatchee Basin, and the Upper East Coast. Depending on the location for implementation, inflow phosphorus concentrations may range from 20 to 150 ppb. Different technologies will likely be needed to handle site-specific conditions and requirements. Because of the many questions that must be answered before implementation of superior water quality treatment technologies (e.g., feasibility of achieving low P concentrations under a range of inflow concentrations; effectiveness at high flow rates; cost effectiveness; long-term performance and O & M costs; "marsh readiness" of effluent waters; permitability of technologies) and because of the many near-term needs and aggressive implementation schedules, funding is needed now to accelerate these demonstration projects.

RESTORATION BENEFITS: Ecosystem restoration benefits of these water quality treatment technologies will be improved water quality to receiving water bodies. Along with efforts to restore or maintain natural hydropatterns, these technologies will help to maintain or restore natural biological communities in the ecosystem.

NOTE: *Cost estimates above cover only the actual demonstration projects. Detailed design, construction and operation costs associated with implementation of full-scale water treatment technologies will require substantially greater investments.*

Time Line and Fiscal Year Budget (in thousands of dollars) for Superior Water Quality Treatment Technology Demos																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
Federal	1218															
State	824															
Subtotal	2042	2145	2528	2434	851											**$10,000**

TITLE: Technical Assistance to Seminole and Miccosukee Indian Reservations			
SUBREGION : Total System	***PROJECT ID:*** TS24	***FINANCIAL REQUIREMENT:*** USDA	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Management		
PROJECT PLAN MANAGER: Smola (561) 686-8800	***BASIS:***	***TOTAL:*** $3,900,000	
LEAD ORGANIZATION(S): NRCS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): IFAS			
COUNTY(S):		***TOTAL:*** $50,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** TS01, TS05M **Critical to:** SW03, SW14, TS85, TS86 **Associated with:** TS22,25,29,EAA7M		***TOTAL:*** $3,850,000	
START: 1997	***END:*** 2008	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Accelerate technical assistance to the Seminole and Miccosukee Indian Reservations to plan and implement resource management systems on a volunteer basis. Technical assistance will be provided at the direction of the Tribal Councils to each agricultural producer to assist in their planning, design, application and management of appropriate BMPs that will improve water quality, land stewardship, agricultural outputs, and the ecological integrity of the landscape.

RESTORATION BENEFITS: This project activity will improve water quality and availability through application of BMPs and other natural resource management techniques. Technical assistance will center upon surface and ground water management infrastructure, irrigation water management facilities, pasture and rangeland management systems, livestock grazing systems, and wildlife habitat improvement practices. Through the application of this project, comprehensive land management actions will be applied which will complement other south Florida restoration efforts currently underway.

Time Line and Fiscal Year Budget (in thousands of dollars) for Technical Assistance to Seminole and Miccosukee Indian Reservations

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
NRCS funded	50	50	50	50	50	50	50	50	50	50	50	50				600
NRCS unfunded	200	200	200	200	200	20 0	200	200	200	200	200	200				2,400
IFAS funded	75	75	75	75	75	75	75	75	75	75	75	75				900
Subtotal																**$3,900**

TITLE: Wetland Reserve Program			
SUBREGION : Total System	***PROJECT ID:*** TS27	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Natural Resources Management	NRCS $2,135,000	
PROJECT PLAN MANAGER: Greg Hendricks (561) 795-5451	***BASIS:*** 3	***TOTAL:*** $2,135,000	
LEAD ORGANIZATION(S): NRCS		***APPROPRIATED TO DATE:*** $ 100,000	
SUPPORTING ORGANIZATION(S):			
COUNTY(S): All		***TOTAL:*** $ 100,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:**		NRCS $2,035,000	
Critical to: TS04, TS05, TS5 TS26			
Associated with: TS15, TS23, TS24		***TOTAL:*** $2,135,000	
START: 1997	***END:*** 2008	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Accelerate assist to private landowners participating in the 1996 Farm Bill, Wetland Reserve Program (WRP). WRP is a voluntary program to restore wetlands. Participating landowners can establish conservation easements of either permanent or a 30-year duration, or can enter into restoration cost-share agreements without easements. In exchange for permanent easements, the landowner receives payment up to the agricultural value of the land and 100 percent of the restoration cost for restoring the wetland. In exchange for 30-year easements, the landowner receives payment up to 75 percent of the agricultural value of the land, and 75 percent of the wetland restoration cost. Voluntary cost-share agreements without easements are for a minimum 10-years duration, and provide up to 75 percent of the restoration cost to restore the wetlands. Easements, when applicable establish limitations on how the land can be used during the contract period. Restoration cost-share agreements establish wetland protection and restoration as the primary land use for the duration of the agreement.

RESTORATION BENEFITS: Healthy and functioning wetlands are an essential part of a restored south Florida ecosystem. Wetlands provide habitat for migratory birds, threatened and endangered species, and important flora and fauna components. Wetlands contribute to the biological diversity, open space, floodwater retention, ground water recharge, and the buffering and filtration of nutrients. WRP potentially will increase the amount of wetlands available, as well as protect and enhance wetland ecosystems throughout south Florida's agricultural landscape.

Time Line and Fiscal Year Budget (in thousands of dollars) for Wetland Reserve Program																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
NRCS unfunded	100	110	120	135	145	160	175	195	215	235	260	285				2,135
Subtotal																**$2,135**

TITLE: Public Lands Information Center			
SUBREGION : Total System	***PROJECT ID:*** TS32	***FINANCIAL REQUIREMENT:*** Federal funds will be matched with over $8 million from the private sector, plus presently undetermined amount from State/City for access adjustments	
PROGRAM CATEGORY: Public Information & Education	***BUDGET CATEGORY:*** Public Outreach		
PROJECT PLAN MANAGER: Dick Ring (305) 242-7710	***BASIS:***	***TOTAL:*** $1,800,000 - Exhibits, staffing and operation over 10 years	
LEAD ORGANIZATION(S): NPS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): USFWS, NOAA, State of Florida		***TOTAL:*** $0	
COUNTY(S): Dade		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to :** **Associated with:**		***TOTAL:*** $1,800,000	
START: 2000	***END:*** 2009	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The Public Lands Information Center, to be located at the junction of U.S. Highway 1 and the Florida Turnpike in Florida City, would be a collaboration with the private sector to utilize space at a planned IMAX complex for exhibits, materials and staffing to convey ecosystem restoration projects and public lands visitor information to visitors to South Florida. Management and operation would be a collaborative effort by Federal and State. The lands have been fully acquired and site development planning is set to begin. Note: The Working Group discussed and adopted an endorsing resolution 4/2/97.

RESTORATION BENEFITS: This project will sustain and increase public awareness, concern and support for restoration. Public support will be the decisive factor in securing sustained political and financial support.

Time Line and Fiscal Year Budget (in thousands of dollars) for Public Lands Information Center

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program				■	■	■	■	■	■	■	■	■	■			
Exhibit Prep			■	■												
Project																
NPS			500	130	130	130	130	130	130	130	130	130	130			1,800
Subtotal																**$1,800**

TITLE: Video Series			
SUBREGION : Total System	***PROJECT ID:*** TS37	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Public Information and Education	***BUDGET CATEGORY:*** Public Outreach		
PROJECT PLAN MANAGER: Rick Cook (305) 242 7714	***BASIS:***	***TOTAL:*** $284,000	
LEAD ORGANIZATION(S): NPS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S):			
COUNTY(S):		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $284,000	
START: 1997	***END:*** 2008	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: To reach a mass audience through collaboration with Public Broadcasting System: (1) complete 1 hour documentary in 1996, (2) Prepare new 1 hour documentaries, (3) Prepare 6 minute segments for PBS broadcast. Arrange for the development and provision of a series of broadcast quality videos that will include the natural, emotional, aesthetic and economic importance of the Everglades. Several agencies involved in the task Force have ongoing video projects which will be coordinated to have an ecosystem restoration focus. The first hour documentary was completed 12/96 and is airing throughout Florida on the PBS network.

RESTORATION BENEFITS: Broadcast media reaches large segments of the population with a consistent message that will improve the public's knowledge and gain public support for projects.

TITLE: WEB Connection			
SUBREGION : Total System	***PROJECT ID:*** TS38	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Public Information and Education	***BUDGET CATEGORY:*** Public Outreach		
PROJECT PLAN MANAGER: Plumb (305) 348-1665	***BASIS:***	***TOTAL:*** $152,000	
LEAD ORGANIZATION(S): OED		***APPROPRIATED TO DATE:*** FY 97: $20,000 FY 98: $12,000	
SUPPORTING ORGANIZATION(S): USACE, SFWMD		***TOTAL:*** $ 32,000	
COUNTY(S): All		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $120,000	
START: 1997	***END:*** 2008	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Phase One: Purchase hardware and software for regional village information and communication management system. Work with the Information Management Council to upgrade web server system hardware/software and required operational/maintenance costs. Phase Two: Work with the Public Outreach Steering and Support Team to design and develop a state of the art Task Force home page on the Internet. WEB presentations will be expanded for new media, such as full animation segments, color images of restoration activities, and other electronic technologies via the Internet. The World Wide Web access to South Florida information will grow as a medium of communication. New developments in access tools, new bandwidth for faster access and the interest in a multi-media augmentation will drive the development of new WEB sites and expansion to existing WEB sites. Funding for the staff, hardware and software will be required throughout the project.

RESTORATION BENEFITS: Phase one greatly enhances collaborative communication and also provides a medium to further meet the requirements of the Water Resources Development Act regarding public participation. Web users are very efficient in seeking and transferring information. Agency labor to service requests is drastically reduced because one installation of information can support thousands of requests. Access to information can be supported for twenty-four hours a day via the Internet. Phase two will move beyond administrative public information to the development of a home page.

Time Line and Fiscal Year Budget (in thousands of dollars) for Web Connection

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Prepare new mat	■	■		■		■		■		■		■				
Expand software			■		■		■		■		■					
Project																
OED	20	12	12	12	12	12	12	12	12	12	12	12				152
Subtotal																**$152**

TITLE: Models and Model Enhancements			
SUBREGION : Total System	***PROJECT ID:*** TS40	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Water Quality, Habitat Protection, and Natural Resources Management	USGS $11,045,000	
PROJECT PLAN MANAGER: Higer, 561-687-6560	***BASIS:*** 2	***TOTAL:*** $11,045,000	
LEAD ORGANIZATION(S): USGS,		***APPROPRIATED TO DATE:*** USGS $6,080,000	
SUPPORTING ORGANIZATION(S): USCOE, NPS, SFWMD			
COUNTY(S): Broward, Collier, Dade, Hendry, Monroe		***TOTAL:*** $6,080,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		USGS $4,965,000 ***TOTAL:*** $4,965,000	
START: 1995	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This program supports modeling and modeling requirements for regional models being developed or maintained by the SFWMD, the USACE, and the ENP. The program includes the following topics of research and applications: evapotranspiration modeling of the Everglades; seepage modeling under protective levees; surface geophysical delineation of fresh / saltwater interfaces; ground / surface water exchange fluxes in the Everglades; geochronology of the Buttonwood Ridge; defining and modeling vegetative resistance to flow; quantity of flow from the Shark River, Harney River, and Broad River; quantity of flow through the Seminole and Miccosukee Tribal Reservations; measurement of surface and ground water flows from the Everglades into Florida Bay; modeling sheet flow entering Florida Bay; measurement of groundwater discharges into Biscayne Bay; measurement of surface water flow into Biscayne Bay and intercoastal waters; measurement of canal and wetland interactions; and defining the hydrogeology of the Surfical Aquifer in southwestern Florida

RESTORATION BENEFITS: Supports Across-Trophic Level System Simulation (ATLSS) Model, the Everglades Landscape Model (ELM), and the Natural Systems Model which are required for science-based decision making for the restoration of south Florida.

Time Line and Fiscal Year Budget (in thousands of dollars) for Models and Model Enhancements																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
USGS																11,045
Subtotal																**$11,045**

TITLE: Distributed Information System and Mapping			
SUBREGION : Total System	***PROJECT ID:*** TS41	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** All	USGS $4,437,000	
PROJECT PLAN MANAGER: Higer, 561-687-6560	***BASIS:*** 2	***TOTAL:*** $4,437,000	
LEAD ORGANIZATION(S): USGS,		***APPROPRIATED TO DATE:*** USGS $2,989,000	
SUPPORTING ORGANIZATION(S): FDEP, SFWMD, DOI			
COUNTY(S): All		***TOTAL:*** $2,989,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		USGS $1448,000	
		TOTAL: 1,448,000	
START: 1995	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This program provides digital mapping products and a data base with established transfer format definitions and spatial integration that promotes dissemination of scientific data and information in a cost effective manner. Cross sections of the digital data and other information available from the SFWMD will be accessible through a USGS gateway on the World Wide Web. The primary products from the program include color infrared digital orthophoto mapping and vegetative and elevation digital format maps.

RESTORATION BENEFITS: Mapping and informational products which will enhance regional hydrologic models and landscape models, such as the ATLSS and ELM models. These are needed for the development of criteria to evaluate the success of restoration efforts.

Time Line and Fiscal Year Budget (in thousands of dollars) for Distributed Information System and Mapping

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
USGS																4,437
Subtotal																**$4,437**

TITLE: High Density Topographic Surveys			
SUBREGION : Total System	***PROJECT ID:*** TS42	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Natural Resource Management	NPS $7,325,000	
PROJECT PLAN MAANGER: Higer (561) 687-6560	***BASIS:*** 2	***TOTAL:*** $7,325,000	
LEAD ORGANIZATI ON(S): USGS, NPS		***APPROPRIATED TO DATE:*** NPS $ 925,000	
SUPPORTING ORGANIZATION(S): USACE, SFWMD			
COUNTY(S): all		***TOTAL:*** $ 925,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		NPS $6,400,000	
		TOTAL: $6,400,000	
START: 1997	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: To model sheet flow, highly accurate elevation data that defines the surface topography is required. It is also a critical input parameter to the landscape models, Natural Systems Model, and hydrologic models. These data are necessary for calculating water surface elevation, slope, depth, velocity, and direction of flow. Accuracy requirements are so stringent that any standard available data products would not suffice for this modeling application due to the flat terrain.

RESTORATION BENEFITS: These data represent a critical need for the infrastructure changes that will be part of the south Florida restoration.

Time Line and Fiscal Year Budget (in thousands of dollars) for High Density Topographic Surveys																
Task	98	99	00	01	02	03	04	05	06	07	08	09	10	11	Unprog	Total
Program																
Project																
NPS	1600	1600	1600	1600												6400
Subtotal																**$6400**

TITLE: Limitations of Environmental Stresses and Physiological Responses on Crop Productivity			
SUBREGION : Total System	***PROJECT ID:*** TS43	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research	ARS $175,000	
PROJECT PLAN MANAGER: Sinclair (352) 392-6180	***BASIS:*** Task Force Priority 3	***TOTAL:*** $175,000	
LEAD ORGANIZATION(S): ARS		***APPROPRIATED TO DATE:*** ARS $70,000	
SUPPORTING ORGANIZATION(S): IFAS			
COUNTY(S): All		***TOTAL:*** $70,000	
		REMAINING FINANCIAL REQUIREMENT: ARS $105,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** GL39, GL40 **Associated with:**		***TOTAL:*** $105,000	
START: 1995	***END:*** 2000	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: ARS scientists in Gainesville have developed a family of simple, mechanistic crop growth models that have proved beneficial in evaluating and predicting crop responses to the environment. These models have predicted crop responses to soil water availability and nutrient availability. Australian scientists have proposed extending this modeling approach to sugarcane.

Research has been initiated to identify sugarcane germplasm that might have the potential to withstand flooded conditions. The approach is to search for sugarcane lines that have well developed aerenchyma cells in their roots to facilitate oxygen transport when the roots are flooded.

RESTORATION BENEFITS: Models already in existence can be used to help predict evapo-transpiration and nutrient runoff impacts of several crop management options throughout the South Florida ecosystem. If this work is extended to higher water table conditions for sugarcane then these benefits can be extended to the Everglades Agricultural Area. Knowledge of agricultural evapo-transpiration and nutrient runoff could then be incorporated by hydrologists into regional and system-wide hydrological models.

Time Line and Fiscal Year Budget (in thousands of dollars) for Limitations of Environmental Stresses and Physiological Responses on Crop Productivity

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
ARS																
Project																
ARS	35	35	35	35	35											175,000
Subtotal																**$175,000**

TITLE: Ecosystem History			
SUBREGION : Total System	***PROJECT ID:*** TS44	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research	USGS - $3,008,000	
PROJECT PLAN MANAGER: Aaron Higer (561) 687-6560	***BASIS:*** 2	***TOTAL:*** $3,008,000	
LEAD ORGANIZATION(S): USGS,SFWMD		***APPROPRIATED TO DATE:*** USGS - $2,008,000	
SUPPORTING ORGANIZATION(S): ENP			
COUNTY(S): All		***TOTAL:*** $2,008,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** TS40 **Associated with:** TS53		USGS - $1,000,000 ***TOTAL:*** $1,000,000	
START: 1995	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This program integrates data types to reconstruct the historic South Florida ecosystem and to provide an understanding of past changes in the system. The products from this program are essential for the completion of ecosystem models. This program also provides information necessary for development of indicators that will serve as measures of restoration success.

RESTORATION BENEFITS: This science effort will provide restoration success targets.

Time Line and Fiscal Year Budget (in thousands of dollars) for Ecosystem History																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
USGS																3,008
Subtotal																**$3,008**

TITLE: Biological Control and Ecology of Invasive Pest Plants			
SUBREGION : Total System	***PROJECT ID:*** TS50	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Water Quality, Habitat Protection/ Restoration, Research	USDA: $7,792,000	
PROJECT PLAN MANAGER: Center (954) 475-0541	***BASIS:*** 1	***TOTAL:*** $7,792,000	
LEAD ORGANIZATION(S): ARS		***APPROPRIATED TO DATE:*** USDA: $2,547,000	
SUPPORTING ORGANIZATION(S): IFAS/ES, NRCS, USFS, Dade			
COUNTY(S): All		***TOTAL:*** $2,547,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** TS03 **Critical to:** TS11 **Associated with:** TS61 TS63		USDA: $5,245,000 ***TOTAL:*** $5,245,000	
START: 1997	***END:*** 2006	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Expand research on the use of biological control agents to control melaleuca, hydrilla, waterhyacinth, waterlettuce, climbing ferns, and other invasive species that interfere with ecosystem restoration efforts. Research will develop safe biological control agents that stress these invasive weeds, and develop management strategies that are efficient, economical, and environmentally sound. The research includes field studies overseas; safety studies in domestic quarantine facilities; release and field colonization technique development; autecology of the targeted weeds, particularly with regard to the effects of the introduced biocontrol agents; development of methods to facilitate recovery of native species after removal of the exotics; and development of integrated management systems incorporation biological control agents.

RESTORATION BENEFITS: Expanded research efforts will increase the numbers of biological control agents available and will accelerate the efficient, economical, and environmentally sound reduction of infestations of invasive pest plant species as well as reduce their rate of spread. Water flow will be increased in many drainages and native habitat will be reclaimed, thus effectively increasing diversity of natural communities. Autecological studies of the invading species will aid in learning why some systems seem more susceptible than others and how to better protect these systems from unwanted plants. These studies will also increase our understanding of the biology of these invasive plants. This increased knowledge base is critical to identifying exploitable weakness of these species that can be used to develop affective management strategies.

Time Line and Fiscal Year Budget (in thousands of dollars) for Biological Control and Ecology of Intrusive Pest Plants

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
Dade County		97	97	97	97	97										**485**
IFAS	60	60	60	60	60	60	60	60	60							540
ARS	783	783	783	783	783	783	783	783	783							6,547
NRCS	10	15	15	15	15	15	15	15	15							130
FS	10	10	10	10	10	10	10	10	10							90
Subtotal																**$7,792**

TITLE: Geodetic Vertical Control Surveys			
SUBREGION : Total System	***PROJECT ID:*** TS52	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: **Science**	***BUDGET CATEGORY:*** Monitoring, Infrastructure Invest.		
PROJECT PLAN MANAGER: Scott Woolam (850) 488-2427	***BASIS:*** **1**	***TOTAL:*** $1,563,000	
LEAD ORGANIZATION(S): **FDEP**		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): NOAA ,NPS, SFWMD, USGS			
COUNTY(S): Broward, Charlotte, Collier, Dade, Lee, De Soto, Glades, Hendry , Highlands, Martin, Monroe, Okeechobee, Orange, Osceola, Palm Beach, Polk, St. Lucie		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $1,563,000	
START: 1997	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: 1, 250 Miles of Second-order, Class I Geodetic Vertical Control Surveys

RESTORATION BENEFITS: Improved accuracy and precision of geodetic vertical control data is an acute need in South Florida. Improved geodetic vertical surveys are of importance for design and performance of infrastructure projects, and for improved accuracy of natural system data, analysis, modeling and restoration measures.

Time Line and Fiscal Year Budget (in thousands of dollars) for Geodetic Vertical Control Surveys

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Ist 250 Miles 2nd 250 Mile 3rd 250 Mile 4th 250 Mile 5th 250 Mile																
Project																
State		**147.5**	**151.5**	**156**	**161**	**165.5**										781.5
Federal		**147.5**	**161.5**	**156**	**161**	**165.5**										781.5
Subtotal		295	303	312	322	331										**$15,630**

TITLE: Ecosystem History: Studies of Land Use and Ecological Change			
SUBREGION : Total System	***PROJECT ID:*** TS53	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research, Information, Management and Assessment		
PROJECT PLAN MANAGER: Tim Patterson (850) 488-4910	***BASIS:*** 3	***TOTAL:*** $1,062,000	
LEAD ORGANIZATION(S): FDEP, USGS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): SFWMD			
COUNTY(S): Broward, Charlotte, Collier, Dade, Lee, DeSoto, Glades, Hendry, Highlands, Martin, Monroe, Okeechobee, Orange, Osceola, Palm Beach, Polk, and St. Lucie		***TOTAL:*** $0	
LINKED PROJECTS: **Dependent on:** **Critical to:** T41S **Associated with:**		***REMAINING FINANCIAL REQUIREMENT:***	
		TOTAL: $1,062,000	
START: 1998	*END:* 2004	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Ecosystem History: Studies of land use and ecological change using archived records transformed to digital data and analyzed through the use of imaging, data base and GIS technologies.

RESTORATION BENEFITS: Goals and objectives for ecosystem restoration require consideration of the original condition of surface resources at the time of initial European contact, or first historic record. Subsequent incremental change up to the present also provides knowledge important for restoration objectives.

Time Line and Fiscal Year Budget (in thousands of dollars) for Ecosystem History: Studies of Land Use and Ecological Change

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Process Design																
Development																
Data Acquisition																
Data Analysis																
Project																
State		123	82	82	82	82	82	80								531
Federal		123	82	82	82	82	82	80								531
Subtotal		246	164	164	164	164	164	160								**$1,062**

TITLE: Assessment of Endocrine-Disrupting Contaminants in the Florida Everglades			
SUBREGION : Total System	***PROJECT ID:*** TS54	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research, Water Quality and/or Habitat Protection		
PROJECT PLAN MANAGER: Don Axelrad 904-414-1347	***BASIS:*** 1	***TOTAL:*** $744,000	
		APPROPRIATED TO DATE:	
LEAD ORGANIZATION(S): FDEP			
SUPPORTING ORGANIZATION(S)*:* EPA,FDACS,FGFC ,NPS, SFWMD, USGS,USFWS, UF			
COUNTY(S)*:* Broward, Charlotte, Collier, Dade, Lee, De Soto, Glades, Hendry , Highlands, Martin, Monroe, Okeechobee, Orange, Osceola, Palm Beach, Polk, St. Lucie		***TOTAL:*** 0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** TS22, TS41 **Associated with:** TS24		***TOTAL:*** $744,000	
START: 1998	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Breeding populations of long-legged wading birds have declined by over 90% in the Everglades since 1940, and a massive restoration effort is now underway aimed at ameliorating the hydrological conditions thought to have precipitated the decline. However, wading bird reproduction now remains depressed even during years with favorable hydrological conditions, and the populations are showing reproductive anomalies that are consistent with endocrine disruption (e.g., late breeding, low threshold to nest abandonment, poor reproductive success, large proportion of the population inactive during the breeding season, possible sex ratio skew). In addition, endocrine disrupting contaminants (EDCs - e.g. some pesticides, dioxins, PCBs) have been implicated in reproductive anomalies of largemouth bass and Florida panthers within the ecosystem.

RESTORATION BENEFITS: Restoration of breeding populations of wading birds is one of the key objectives for south Florida ecosystem restoration.

Time Line and Fiscal Year Budget (in thousands of dollars) for Assessment of Endocrine-Disrupting Contaminants in the Florida Everglades

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program design		■														
Data Collection		■	■	■												
Analysis		■	■	■												
Produce Report					■											
Project																
State		120	20	20	20											180
Federal		189	186	189	0											564
Subtotal		309	206	209	20											$744

TITLE: Natural System Boundary Alternatives and Natural Lands Information System			
SUBREGION : Total System	***PROJECT ID:*** TS55	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Information Management/Assess		
PROJECT PLAN MANAGER: Haddad (813) 896-826	***BASIS:*** 1	***TOTAL:*** $310,000	
LEAD ORGANIZATION(S): FDEP		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): EPA, SFWMD, USACE			
COUNTY(S): Broward, Charlotte, Collier, Dade, De Soto, Glades, Hendry, Highlands, Lee, Martin, Monroe, Okeechobee, Orange, Osceola, Palm Beach, Polk, St.Lucie		***TOTAL:*** $0	
LINKED PROJECTS: **Dependent on:**		***REMAINING FINANCIAL REQUIREMENT:***	
Critical to: TS11, TS34, TS41			
Associated with: TS35, CE06, SE7		***TOTAL:*** $310,000	
START: 1998	***END:*** 2000	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project identifies and characterizes the natural areas and potential management boundaries of the south Florida ecosystem at a management level to assist in the priorities for land and water management. The project provides information that serves to maintain existing ecological functions and restores degraded ecological systems in order to have a sustainable ecosystem. This is currently an unfunded multi-institutional effort under the request of the Governor's Commission for a Sustainable South Florida. The effort is ARCVIEW GIS-based and includes selected natural systems information and other management-oriented data that can assist in planning, acquisition, and management for the south Florida ecosystem. The resultant ARCVIEW tool will allow investigators and managers to view priority natural and restorable places based on the relative ranking of management criteria. A prototype for south Florida has been developed and endorsed by the Governor's Commission. The tool contains land and wetland polygons representing natural, restorable places or places considered for purchase and describes the status of each polygon in terms of management criteria such as hydrologic conditions, habitat quality and use, wildlife distribution, and water quality. The Florida Department of Environmental Protection's Florida Marine Research Institute is conducting the data gathering and GIS system development in cooperation with the SFWMD, USEPA, FDEP Water Facilities Division, and USACE through the Comprehensive Wetlands and Permitting Strategy. The funding request is for a dedicated staff person, travel, and software refinement.

RESTORATION BENEFITS: This is a high priority project requested by the Governor's Commission for Sustainable South Florida. The interactive ARCVIEW GIS application will make accessible to public and private users information about natural resources and human impacts. This will facilitate both strategic and action planning for land acquisition, management, and restoration.

Time Line and Fiscal Year Budget (in thousands of dollars) for Natural System Boundary Alternatives and Natural Lands Information System

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Natural system boundaries app.		■														
Natural lands information sys.		■	■													
Info. update/ Maintenance		■	■	■												
CDROM/Internet for distribution		■	■													
Interactive natu-ral system app.			■													
Project																
State		65	45	45												155
Federal		65	45	45												155
Subtotal		130	90	90												**$310**

TITLE: Identification and Documentation of Ecosystem Reference Areas as a Biodiversity Monitoring Framework			
SUBREGION : Total System	***PROJECT ID:*** TS56	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research, Information Managt and Assessment		
PROJECT PLAN MANAGER: Leo Minasian (904) 488-8346	***BASIS:*** 1	***TOTAL:*** $200,000	
		APPROPRIATED TO DATE:	
LEAD ORGANIZATION(S)*:* FDEP, NBS, NPS, USFWS, EPA			
SUPPORTING ORGANIZATION(S)*:* GFC, NOAA, NRCS, SFWMD			
COUNTY(S)*:* Broward, Charlotte, Collier, Dade, Lee, De Soto, Glades, Hendry , Highlands, Martin, Monroe, Okeechobee, Orange, Osceola, Palm Beach, Polk, St. Lucie		***TOTAL:*** 0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** TS41 **Associated with:**		***TOTAL****:* $200,000	
START: 1999	***END:*** 2000	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Biodiversity conservation needs a monitoring program which accounts for status and change in our best remaining natural areas. Ecosystem reference areas (ERAs), defined, identified and studied at appropriate scales, would serve as benchmarks for ecological integrity and change, as is now done for aquatic environments through FDEP's Biocriteria Program. This hierarchical framework of ERAs for the South Florida Ecosystem will address biodiversity in a broad ecological range of upland and wetland communities throughout South Florida, where biodiversity, endangerment and the need for knowledge is greatest. This proposes a two-year study to to develop integrative concepts and methodologies, and to identify highest quality remnant ecosystems/natural communities, on regional and local scales. These ERAs will help us focus future monitoring and research, to answer questions and aid in decisions about other ecosystems which are of comparable type, but usually lower quality.

RESTORATION BENEFITS: ERAs will serve as benchmarks for ecological integrity, biodiversity, landscape character, and similar measures representing minimal impairment of natural systems. Knowledge of ecosystem structure and function from such areas is an essential basis for ecosystem management and restoration objectives.

Time Line and Fiscal Year Budget (in thousands of dollars) for Identification and Documentation of Ecosystem Reference Areas as a Biodiversity Monitoring Framework

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Process																
Project																
State		100														100
Federal		100														100
Subtotal																**$200**

TITLE: Integrated Management Program for Invasive Species within High Quality Natural Areas of South Florida			
SUBREGION : Total System	***PROJECT ID:*** TS61	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Area Mgmt/Habitat Protection		
PROJECT PLAN MANAGER: Wayne Jipsen 904/232-2219	***BASIS:***	***TOTAL:*** $34,000,000	
LEAD ORGANIZATION(S): USACE, SFWMD, ENP, BCNP, FDEP		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): ARS, BIA, DOI, EPA, FDACS, FGFWFC, FDOT, IFAS/ES, NPS, NRCS, USDA, USFWS, USFS, USGS			
COUNTY(S): All		***TOTAL:*** 0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** TS11 **Critical to:** TS31 **Associated with:** TS01, GL03, SW15, CE09		***TOTAL:*** $34,000,000	
START: 1998	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Implementation of a coordinated program of invasive species management in high quality natural areas of the south Florida ecosystem. This program will focus on efforts to protect such high quality natural areas as Everglades National Park and Big Cypress National Preserve. It will include management of invasives inside these natural areas and in adjacent lands to prevent re-infestation. The program will concentrate on actual removal operations targeting invasive species, such as melaleuca (*Melaleuca quinquenervia*), Australian pine (*Casuarina equistifolia)*, Brazilian pepper (*Schinus terebinthifolius*), latherleaf (*Colubrina asiatica*) and the old world climbing fern (*Lygodium micorphyllum*). An intergrated pest management strategy will be utilized relying heavily upon proven chemical control, mechanical control, biological control and environmental manipulation techniques. In the absence of such, new and/or emerging techniques will be developed and/or refined to provide the array of management methods necessary to meet the program goals. Additional program components may include the following: delineation of the extent of invasive plant populations; pre- and post-treatment site documentation; post-treatment monitoring and control of invasive species regrowth; and replanting with native species. Work may begin in FY 98 and continue through FY 02.

RESTORATION BENEFITS: The spread of invasive exotic species is producing profound environmental consequences in high quality natural areas of the South Florida ecosystem, such as the Everglades National Park and Big Cypress National Preserve. As invasives are controlled and deteriorated areas restored, beneficial vegetative communities will be reestablished. Native plant and animal diversity will return, with a resultant shift to a healthy ecosystem.

Time Line and Fiscal Year Budget (in thousands of dollars) for Integrated Management Program for Invasive Species within High Quality Natural Areas of South Florida

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
ENP		3000	3000	1500	1500	1200										10200
BCNP		1000	1000	500	500	400										3400
SFWMD		4000	4000	2000	2000	1600										13600
FDEP		750	750	375	375	300										2550
DOI-BIA		750	750	375	375	300										2550
Other/Misc.		500	500	250	250	200										1700
Subtotal		10000	10000	5000	5000	4000										$34,000

TITLE: Public Education for the Restoration Project			
SUBREGION : Total System	***PROJECT ID:*** TS62	***FINANCIAL REQUIREMENT:*** $25,000 match (in kind contribution by Env. Ed. Director, Env. Ed specialist and graphics staff and printing, available awaiting federal match.)	
PROGRAM CATEGORY: Public Education	***BUDGET CATEGORY:*** Natural Resource Management	***TOTAL:*** $50,000	
PROJECT PLAN MANAGER: Jim Lewis (904) 488-9334	***BASIS:*** 2 and 3	***APPROPRIATED TO DATE:***	
LEAD ORGANIZATION(S): FDEP			
SUPPORTING ORGANIZATION(S): SFWMD/EPA/Audubon			
COUNTY(S): All		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** TS30, TS33		Federal partner to be determined: $25,000 FDEP: $25,000 ***TOTAL:*** $50,000	
START: 1998	***END:*** 2000	***APPROVED:*** 11/97	***LAST REVISION:*** **2/98**

DESCRIPTION: Develop public education materials and programs for the overall Ecosystem Restoration effort, but with special concentration on each of the individual sub-regions. The effort will include, but would not necessarily be limited to materials and programs with the multiple aim of educating local citizens on what is being done, why it is being done, and how they can help in the effort. Any material or program developed under this effort must show how the restoration will affect citizens in the area or sub-region as well as how they would be adversely affected if it is not done. Educational emphasis would be placed on the benefits of the restoration to the entire sub-regional ecosystem. Products would include publications, development of local volunteer groups and programs, to undertake community activities that educate the local population. Other means of bringing the message to the public include educating local media (print and broadcast) on the importance of the effort. Education staff would work with the Sub-region teams to develop programs that appropriately reflect the key issues and priorities of the sub-region.

RESTORATION BENEFITS: On-the-ground restoration will be much more difficult if the citizens who live in and around the area being restored do not understand, or support, the activities being undertaken. Properly conducted public education activities will increase citizen support for the restoration activities for the South Florida Ecosystem as a whole and for the individual sub-regions. A citizenry that understands the reasons for the restoration effort and how it will benefit them, will be more willing to support--and even to help through volunteer activities--the effort. The result will be fewer delays in the implementation of projects in the sub-regions because of confrontation and controversy over the merits of the restoration effort.

Time Line and Fiscal Year Budget (in thousands of dollars) for Public Education for the Restoration Project

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Development		■	■													
Implementation			■	■												
Project																
State		25														25
Federal		25														25
Subtotal																**$50**

TITLE: Lygodium Microphyllum Control			
SUBREGION : Total System	***PROJECT ID:*** TS63	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management/Science	***BUDGET CATEGORY:*** Natural Resource Management		
PROJECT PLAN MANAGER: Dan Thayer (561) 687-6129	***BASIS:*** 2	***TOTAL:*** $3,500,000	
LEAD ORGANIZATION(S): SFWMD		***APPROPRIATED TO DATE:*** SFWMD: $75,000	
SUPPORTING ORGANIZATION(S): USACE, FDEP, USDA		FDEP: $20,000	
COUNTY(S): All		***TOTAL:*** $95,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:**			
Critical to: TS11			
Associated with: TS03		***TOTAL:*** $3,405,000	
START: 1998	***END:*** 2011	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: *Lygodium microphyllum* (Old World climbing fern), native to Australia, Asia and Africa was first found in Florida in the late 1960s. From its introduction site near the Martin/Palm Beach county line, this exotic twining fern has now spread into more than 39,000 acres of undisturbed south Florida wetlands. Undetected in 1990, *Lygodium microphyllum* now occupies more than 17,000 acres of the Loxahatchee National Wildlife Refuge.

Lygodium microphyllum can climb tens of meters into cypress forests, overtop and smother everglades tree islands, and spread horizontally into open wetland marshes. Once established, this plant seriously alters fire ecology. Prescribed burns and wildfires that normally terminate at cypress sloughs in the wet season now continue through. Burning mats of fern break free during fires, and are kited away by heat plumes, leading to distant fire spotting. Additionally, the plant acts as a "ladder" carrying fire into native tree canopies. Preliminary data on spore counts (724 spores/cubic meter/hour) indicates that *Lygodium microphyllum* is capable of long distance dispersal. Plants have recently been discovered in Collier County's Fakahatchee Strand.

This project will develop chemical and biological controls for *Lygodium*. Preliminary herbicide trials have resulted in variable control, and long-term results are not yet available. Investigations into herbicidal and physical control methods need to be explored further in areas where *Lygodium microphyllum* already has a strong foothold. The successful establishment of biological controls will be important in reducing the exponential rate of expansion now occurring in south Florida. The potential for biocontrol of *Lygodium microphyllum* is high due to few native and economic plant conflicts. Preliminary and brief examinations of a few populations in its native range have already identified several natural enemies. Biocontrol is essential if this invader is to be effectively contained, much less controlled.

RESTORATION BENEFITS: The uncontrolled expansion of *Lygodium microphyllum* in south Florida constitutes a serious threat to the Everglades ecosystem. Ecosystem restoration benefits of *Lygodium microphyllum* control research will be conservation of native plant communities and improved maintenance of historic fire regimes.

Time Line and Fiscal Year Budget (in thousands of dollars) for Lygodium Microphyllum Control

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
Biocontrol	0	95	150	150	150	150	150	150	150	150	150	150	150	150	150	
Moniitoring	0	0	50	50	50	50	50	50	50	50	50	50	50	50	50	
Herbicide Trials	0	0	50	50	50	50	50	50	50	50	50	50	50	50	50	
Subtotal																**$3,500**

TITLE: Mercury, Geochemistry, and Nutrient Process Studies			
SUBREGION : Total System	***PROJECT ID:*** TS67	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research	USGS $4,722,000	
PROJECT PLAN MANAGER: Higer, 561-687-6560	***BASIS:*** 1	***TOTAL:*** $4,722,000	
LEAD ORGANIZATION(S) USGS, SFWMD		***APPROPRIATED TO DATE:*** USGS $3,122,000	
SUPPORTING ORGANIZATION(S): WIDNR, USEPA			
COUNTY(S): Broward, Dade, Monroe, and Palm Beach		***TOTAL:*** $3,122,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		USGS $1,600,000 ***TOTAL:*** $1,600,000	
START: 1995	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This program is determining the effect that environmental factors, such as concentration of dissolved organic carbon, nurients, and sulfur, as well as, hydrologic conditions, have on the transport, sedimentation, volutilization, and methylation of mercury in the Everglades and its ultimate entry into the food chain. The results will be useful for predicting the effects of restoration on environmental mercury levels in the Everglades.

RESTORATION BENEFITS: This effort will provide managers with geochemical process information when they are making crucial decisions on a changes to the infrastructure in South Florida.

Time Line and Fiscal Year Budget (in thousands of dollars)for Mercury, Geochemistry, and Nutrient Process Studies

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
USGS																4,722
Subtotal																**$4,722**

TITLE: Coordinated Management Program For Invasive Plant Species On Public And Private Lands In South Florida			
SUBREGION : *Total System*	***PROJECT ID:*** TS83	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY:	***BUDGET CATEGORY:***		
PROJECT PLAN MANAGER: Wayne Jipsen 904/232-2219	***BASIS:***	***TOTAL:*** $40,000,000	
LEAD ORGANIZATION(S): USACE		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): ARS, BCNP, BIS, DOI, ENP, EPA, FDACS, FDEP, FGFWFC, FDOT, IFAS/ES, NPS, NRCS, SFWMD, USDA, USFWS, USFS, USGS			
COUNTY(S): All		***TOTAL:*** 0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** TS01, TS03, TS11, GL03		***TOTAL:*** $40,000,000	
START: 1998	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Implementation of a coordinated program of invasive species management on public and private lands of the South Florida ecosystem that are not included in the project targeting high quality natural areas. The program will concentrate on actual removal operations targeting invasive species, such as melaleuca (*Melaleuca quinquenervia*), Australian pine (*Casuarina equistifolia)*, Brazilian pepper (*Schinus terebinthifolius*), latherleaf (*Colubrina asiatica*), torpedograss (*Panicum repens)* and the old world climbing fern (*Lygodium micorphyllum*). An intergrated pest management strategy will be utilized relying heavily upon proven chemical control, mechanical control, biological control and environmental manipulation techniques. In the absence of such, new and/or emerging techniques will be developed and/or refined to provide the array of management methods necessary to meet the program goals. Additional program components may include the following: delineation of the extent of invasive plant populations; pre- and post-treatment site documentation; post-treatment monitoring and control of invasive species regrowth; and replanting with native species. Work may begin in FY 98 and continue through FY 02.

RESTORATION BENEFITS: Invasive exotic plants, of one species or another, are located throughout the entire South Florida ecosystem. In order to truly protect any area of the ecosystem from the habitat degradation associated with the invasion, colonization and subsequent proliferation of these invasive plants, they will need to be managed throughout the entire ecosystem. This project will allow a coordinated, ecosystem-wide management program to be established which targets all invasive exotic plant species. As invasives are controlled and deteriorated areas restored, beneficial vegetative communities will be reestablished. Native plant and animal diversity will return, with a resultant shift to a healthy ecosystem.

Time Line and Fiscal Year Budget (in thousands of dollars) for Invasive Coordinated Management Program For Plant Species On Public And Private Lands In South Florida

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
USACE		1000	833	666	500	333										3332
SFWMD		2000	1667	1334	1000	667										6668
DOI		1000	833	666	500	333										3332
FDEP		1000	832	666	500	333										3331
Other Misc.		7000	5835	4668	3500	2334										3337
Subtotal																$40,000

TITLE: Biological Control For Melaleuca And Other Invasive Exotic Species Enhancement Program			
SUBREGION : Total System	***PROJECT ID:*** TS84	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:***		
PROJECT PLAN MANAGER: Wayne Jipsen 940/232-2219	***BASIS:***	***TOTAL:*** $5,310,000	
LEAD ORGANIZATION(S): USACE, USDA-ARS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): DOI, SFWMD, FDEP, FDACS, FGFWFC, USFWA			
COUNTY(S): All		***TOTAL:*** 0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** TS03, TS11, GL03, SW15, CE09		***TOTAL:*** $5,310,000	
START: 1998	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The project addresses three avenues to increase the capability of land managers to utilize biological control technologies in the management of melaleuca and other invasive exotic species in the south Florida ecosystem. Two avenues are detailed below:

1) Upgrading and retrofitting of the current quarantine facility in Gainsville, Florida.

2) Large-scale rearing of approved biological control organisms for release at multiple sites against a number of invasive species.

RESTORATION BENEFITS: Melaleuca trees and other invasive exotic species are rapidly invading the natural Everglades habitat. Their growth is so dense that the typical characteristics of native habitat are completely destroyed. Biological control agents re needed to provide a truly integrated management approach to many of the invasive species problems facing the ecosystem today. This approach will provide the means to establish a viable biological control program.

Time Line and Fiscal Year Budget (in thousands of dollars) for Biological Control For Melaleuca And Other Invasive Exotic Species Enhancement Program

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Upgrade facility		560														560
Operations		950	950	950	950	950										4750
Project																
		1510	950	950	950	950										5310
Subtotal																$5,310

TITLE: Seminole Tribe Data Collection and Monitoring			
SUBREGION *:Total System*	***PROJECT ID:*** TS85	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Water Quality		
PROJECT PLAN MANAGER: Craig Tepper, 954-966-6300	***BASIS:*** 3	***TOTAL:*** $6,384,000	
		APPROPRIATED TO DATE:	
LEAD ORGANIZATION(S): Seminole Tribe of Florida		BIA $75,000	
SUPPORTING ORGANIZATION(S):): BIA, USGS, EPA, SFWMD, BCNP/NPS		NPB $60,000	
COUNTY(S): Hendry, Glades, Broward, Collier, St. Lucie		***TOTAL:*** $135,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** TS8, TS86, SW03, SW14, TS82, SW17, SW18,SW19		***TOTAL:*** $6,249,000	
START: 1997	***END:*** 2010	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Water quality monitoring consists of water sampling, analyses, data management, and reporting. Data collection and water quality monitoring efforts are needed for the Big Cypress, Brighton, Immokalee, and Hollywood Reservations as well as the Coconut Creek and Fort Pierce Trust Lands. The Tribe will also work with the Big Cypress National Preserve to conduct water quality, water quantity, and biological monitoring along the common border. In addition, under an agreement with the SFWMD, the Tribe is required to monitor the quality of the water discharged from the Big Cypress Reservation. The Tribe has been conducting water quality monitoring for some time, however, the Tribe plans a more comprehensive program. Due to funding below requested levels and expectations, the Tribe's water quality monitoring work is behind the Tribe's internal schedule. This monitoring effort is a major undertaking with an appropriate price tag through FY 2010, the tribe estimates that its comprehensive data collection and monitoring program will cost $6,384,000. The bulk of that funding need is unmet.

RESTORATION BENEFITS: Data analysis and reporting is necessary for Tribal development and implementation of protective surface water quality standards and establishment of baseline conditions. Biological, meteorological, and air quality sampling is needed to provide feedback on proposed success criteria necessary for operation and adaptive management of the Big Cypress Reservation Water Conservation Plan and implementation of BMP's on the Big Cypress Reservation. It will also be necessary to characterize the surface water for the L-28 Borrow canal, L-28 Interceptor Canal, North and West Feeder canals, and for the proposed network of 22 wetland monitoring sites on the Big Cypress Reservation. For the Brighton Reservation, a comprehensive monitoring and assessment program will be designed which will help evaluate the impacts of Tribal activities and support adaptive management.

Time Line and Fiscal Year Budget (in thousands of dollars) for Seminole Tribe Data Collection & Monitoring

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Big Cypress																
Brighton																
Immokalee																
Hollywood																
Trust Lands																
Project																
NPS	60	695	327	339	351	364	377	391	405	405	405	405	405	405		5,334
BIA	75	75	75	75	75	75	75	75	75	75	75	75	75	75		1,050
Subtotal	135	770	402	414	426	439	452	466	480	480	480	480	480	480		$6,384

TITLE: Seminole Tribe Development of Water Quality Standards			
SUBREGION : Total System	***PROJECT ID:*** TS86	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Water Quality		
PROJECT PLAN MANAGER: Craig Tepper, 954-966-6300	***BASIS:*** 1	***TOTAL:*** $108,000	
LEAD ORGANIZATION(S): Seminole Tribe of Florida		***APPROPRIATED TO DATE:*** STOF $64,000	
SUPPORTING ORGANIZATION(S): EPA, SFWMD			
COUNTY(S): Hendry, Glades, Collier, Broward, St. Lucie		***TOTAL:*** $64,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** TS81, TS08		***TOTAL:*** $44,000	
START: 1995	***END:*** 2000	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The Environmental Protection Agency (EPA) certified the Seminole Tribe to be "treated as a State" under the Clean Water Act (CWA). The Tribe is authorized to establish and enforce water quality Standards on its Reservation under Section 518(e) of the CWA. Standards for the Big Cypress Reservation were adopted by the tribal Council in September, 1996 and were certified by the EPA in October 1997. Development of standards for the Brighton Reservation began August, 1997 and are expected to be adopted by the Tribal Council in July, 1998. Standards for the Hollywood and Immokalee Reservation, as well as the Fort Pierce and Coconut Creek Trust Lands, will be completed by December 2000.

RESTORATION BENEFITS: Establishment and enforcement of water quality standards will improve the quality of water entering and leaving the Reservations. Required certification of restoration activities in and around the Reservations will insure compliance with water quality standards and supply additional opportunities for public input.

Time Line and Fiscal Year Budget (in thousands of dollars) for Seminole Tribe Development of Water Quality Standards

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Brighton																
Hollywood																
Immokalee																
Ft. Pierce																
Coconut Creek																
Project																
Seminole Tribe		64	33	11											64	44
Subtotal																

3.2 *KISSIMMEE VALLEY*
Sub-Region 1

ECOLOGICAL SETTING

The 3,000-square-mile Kissimmee River basin forms the headwaters of the Everglades System. It extends southward from Orlando about 90 miles to Lake Okeechobee and includes an upper and lower basin. The upper basin contains a series of interconnected lakes, of which Lakes Tohopekaliga, Hatchineha, Cypress, and Kissimmee are the largest. The lower basin contains Canal-38 and remnants of the Kissimmee River.

Historically, the Kissimmee River meandered approximately 103 miles from Lake Kissimmee to Lake Okeechobee through a 1-2 mile wide floodplain. The River and its flanking floodplain consisted of a mosaic of wetland plant communities and supported a diverse group of waterfowl, wading birds, fish, and other wildlife. The historic Kissimmee River was hydrologically unique among North American river systems in that it had prolonged periods of extended floodplain inundation. The headwater lakes once were the deeper portions of a vast marsh complex. During the wet summer months and periods of heavy rainfall, natural drainage occurred by the overtopping of the upper lakes and the overflow of water across the wide shallow marshes. The broadleaf marsh and wet prairie communities once dominated the vast wetlands marsh complex which connected the headwater lakes.

The basin was modified for navigation and flood control purposes in the late 1800s when the lakes were connected. The most significant alterations occurred between 1962 and 1971, as a result of the C&SF Project. That project established a regulation schedule for the upper basin lakes and culminated in channelization of the 103-mile system of Kissimmee River oxbows and floodplains into the 56-mile C-38. Six water control structures in C-38 maintain water elevation, control water releases, and provide lockage.

Most of the upland portions of the lower basin have been converted to large tracts of improved pasture and some row crop cultivation. However, native prairie, scrub, and pine flatwoods remain on both sides of the historic river floodplain. This native upland vegetation provides habitat for a number of threatened and endangered species, including red-cockaded woodpecker, Florida scrub jay, Florida grasshopper sparrow, and Audubon's crested caracara. In addition to native mammals such as black bear and bobcat, the basin once supported a notable warm-water fishery for species such as bass, bluegill, and black crappie. The lakes are important nesting areas of the endangered snail kite, and the wetlands support significant wading bird populations. The basin also provided important over-wintering habitat for migratory waterfowl.

The River was channelized between 1962 and 1971. Two thirds of the historical floodplain was drained. One third of the channel was destroyed by excavation of the canal and placement of the spoil material. Along with the channelization the headwater lakes were regulated for flood control purposes as part of this flood control project. This regulation eliminated the natural water level fluctuations in the lakes. The interconnecting marsh was drained and the extreme highs and lows which provide critical functions in the maintenance of fish and wildlife habitat were eliminated. Implementation of the Kissimmee Flood Control project led to drastic declines in wintering waterfowl, wading bird and game fish populations, as well as loss of ecosystem functions.

LINKAGE TO THE TOTAL SYSTEM

As the headwaters of the entire Everglades system, the Kissimmee River basin is critical to restoration success. The broad wetland/riverine connection between the Kissimmee River and Lake Okeechobee needs to be re-established because basin wetlands provide critical habitat for a number of endangered and threatened species; support a diversity of game fish, wading birds and waterfowl; and improve the quality of

waters entering Lake Okeechobee. Lying just south of the extensive urban development surrounding Orlando, the Upper Chain of Lakes is threatened by anthropogenic impacts. The large tourist area of Kissimmee-Walt Disney World is within the borders of the Sub-region.

ECOSYSTEM PROBLEMS AND RESTORATION OBJECTIVES

Ecological impacts in the Kissimmee basin include diminished floodplain habitat diversity, reduction of wading bird populations and loss of fishery forage and riverine fish species.

The impacts of flood control, navigation, agriculture, and development in the Kissimmee basin are well documented. The impacts of channelization are significant. In addition to direct physical destruction of the river and floodplain habitat from canal excavation and deposition of soil, channelization and lake regulation has impacted the basin primarily by altering hydrologic regimes.

The nature and rate of energy exchange between the river and floodplain also have been disturbed, affecting the functional integrity of the system. Lack of flow has degraded water quality, caused excessive sedimentation, diminished habitat quality and diversity, and degraded biological communities. The impacts of channelization were quickly recognized, and calls for restoration of the river began before the Kissimmee River Flood Control Project was complete. Several major studies have been conducted to evaluate restoration alternatives. A collaborative effort of numerous Federal and State agencies reached the conclusion that re-establishing a fully functional river and floodplain required recovery of the natural hydrologic regime. That could only be done by backfilling a long, continuous section of C-38, connecting the remnant portions of the original river, and delivering water from the upper basin in a manner that mimics the natural system.

Efforts are now underway to restore the ecological integrity of the River and floodplain by implementing these recommendations. The Kissimmee River Restoration Project is the world's largest such effort and the first of its kind in the United States. While Kissimmee River Restoration is the largest restoration effort in the basin other efforts are being implemented to address the impacts to the ecosystem beyond river/floodplain ecosystem. These efforts are critical to the holistic ecosystem response in the basin.

RESTORATION OBJECTIVES:

The restoration objectives of critical importance for the Sub-region 1 have been identified by the Working Group and are listed as follows:

- Restore the ecological integrity of the water bodies and their associated flood plain ecosystem.
- Restore historical hydrologic conditions to the greatest extent possible.
- Recreate the historical watershed connectivity to the greatest extent possible.
- Restore basin wetlands, while maintaining or enhancing adjacent upland habitats.
- Improve water quality of surface waters.
- Restore/enhance fish and wildlife habitat.
- Decrease the standing populations of aquatic invasive plant to lowest possible level in the Kissimmee subregion.

RESTORATION PROJECTS

Important restoration projects in progress or proposed for the Sub-region are identified on the following pages:

TITLE: Kissimmee River Restoration Project			
SUBREGION : 1	***PROJECT ID:*** KV01	***FINANCIAL REQUIREMENT:***	
CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Infrastructure Investment	USACE - $247,400,000 SFWMD - $247,400,000	
PROJECT PLAN MANAGER: Brooks-Hall, (904) 232-3155	***BASIS:*** Task Force Priority V, Ecosystem Restoration	***TOTAL:*** $494,800,000	
LEAD ORGANIZATION(S): USACE, SFWMD		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): USFWS		USACE - $31,371,000 SFWMD - $101,000,000	
COUNTY(S): Osceola, Polk, Okeechobee, Glades		***TOTAL:*** $132,371,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** TS39, KV05 **Critical to:** KV02 **Associated with:** KV04		USACE - $216,029,000 SFWMD - $146,400,000 ***TOTAL:*** $362,429,000	
START: 1994	***END:*** 2009	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The Kissimmee River Restoration Project will restore the ecological integrity of the historical Kissimmee River/floodplain ecosystem through two major construction components: Headwaters Revitalization and Lower Basin Restoration. The Headwaters Revitalization component will restore more natural water level fluctuations in Lakes Kissimmee, Cypress, and Hatchineha in the upper Kissimmee basin. Two existing canals and the Lake Kissimmee outlet structure (S-65) that discharges to the river will be enlarged. In the lower basin, natural flows will be restored to the river channel and floodplain. This will be accomplished by backfilling 22 miles of the existing Canal 38 (C-38), reconstructing 9 miles of remnant river channel, and removing two water control structures and the adjacent locks (S-65B and S-65C).

RESTORATION BENEFITS: The project will restore the ecological integrity of the historical Kissimmee River/floodplain ecosystem by recreating approximately 40 square miles of the river/floodplain ecosystem, including 43 miles of contiguous river channel and 27,000 acres of floodplain wetlands. Other benefits include: restoration of critical fish and wildlife habitat necessary to recreate biological diversity in the floodplain ecosystem; improved water quality (e.g., increased dissolved oxygen in the river channel and reduced nutrient loads to Lake Okeechobee).

Time Line and Fiscal Year Budget (in thousands of dollars) for Kissimmee River Project

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Upper Basin																
Design	■	■														
Real Estate	■	■														
Construction	■	■	■													
Lower Basin																
Design	■	■	■	■	■	■	■	■	■	■						
Real Estate	■	■	■	■	■	■	■	■	■	■						
Construction	■	■	■	■	■	■	■	■	■	■	■	■	■			
Project																
USACE		3000	27300	25800	30100	25900	37900	18400	10300	9200	9300	16200	2629	0		216029
SFWMD		72373	46400	12800	3605	7	2230	18400	10300	9200	9300	16200	2085	0	157,087	202900
Subtotal		75373	73700	38600	33705	25907	40130	26800	20600	18400	18600	32400	4714	0	157087	**418929**

TITLE: Lake Istokpoga Ecosystem Restoration and Management			
SUBREGION : 1	***PROJECT ID:*** KV02	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Management	PARTIAL: Remove tussock, COMPLETE: Remove shoreline aquatic weeds	
PROJECT PLAN MANAGER: Clell Ford 941-386-6545	***BASIS:***	***TOTAL:*** $17,325,000	through FY 02
LEAD ORGANIZATION(S): FGFC, Highlands Board of Commissioners		***APPROPRIATED TO DATE:*** SFWMD (Tussock) FGFWFC (Tussock) FDEP (Hydrilla) USACE (Water Levels) ***TOTAL:***	 $2,500,000 $1,250,000 $3,500,000 $405,000 $7,655,000
SUPPORTING ORGANIZATION(S): FDEP, SFWMD, USACE			thru FY 98
COUNTY(S): Highlands County		***REMAINING FINANCIAL REQUIREMENT:*** Remove Tussocks Assess Water Quality Remove Shoreline Aquatic Weeds Restore Natural Water Levels ***TOTAL:***	 $3,750,000 $ 125,000 $3,450,000 $2,345,000 $9,670,000
LINKED PROJECTS: **Dependent on:** **Critical to:** KV01 **Associated with:**			
START: 1998	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Water levels in Lake Istokpoga, the largest lake in Highlands County, and the second largest in the Kissimmee River Basin, were stabilized for flood control and water supply in the 1960s as part of the Central and South Florida Flood Control Project. This stabilization, along with development in the watershed and the invasion of hydrilla and other exotic weeds, has affected the Lake Istokpoga ecosystem. These impacts range from degradation of fish and wildlife habitat, and restrictions on human activities, to severely impaired lake access, devaluation of riparian property, and deterioration of flood control capabilities. Unlike other systems in the Kissimmee River Basin, large-scale drawdowns of Istokpoga to remove tussock and control shoreline vegetation are not feasible due to the limited ability to refill the lake using water stored upstream. Expected endpoints or restoration goals for the Lake Istokpoga ecosystem are being developed for application to this and other restoration projects.

Tussock islands, estimated by the FGFWFC to occupy approximately 10%, or 2500 acres of the 27692 acre lake, have greatly expanded over the last several years as a result of stabilized water levels. These islands displace habitat for desirable game fish as well as waterfowl and other species. Tussocks also are a serious threat to the ability of the lake to store, and flood control structures to move water in the event of a flood. The FGFWFC and Highlands County are working with the FDEP to develop a plan for removal of tussock islands. SFWMD and the FGFWFC have committed funding to remove ½ of the tussock currently found in Lake Istokpoga over the next 5 years. The proposed work request would fund removal of the remaining 1250 acres of tussock as well as provide for water and sediment quality analysis to determine impacts to the lake ecosystem from tussock removal, and provide for reporting on ecosystem-level impacts.

Lake Istokpoga, classified as a eutrophic lake based on nutrient and algae levels, has relatively good water quality. Preventing degradation or improving water quality is critical to ecosystem restoration. Development both within Istokpoga and upstream, has caused large changes in nutrient inputs to the surface water. Both SFWMD and volunteers for Florida Lakewatch have collected water quality information regularly for a number of years, but this information has not been compiled or analyzed in a comprehensive manner. Several aspects of water quality in Lake Istokpoga critical to evaluating ecosystem restoration and management, including net flux of phosphorus and nitrogen from both Arbuckle and Josephine Creeks, impact of proposed tussock removal, impact of cyclic large-scale hydrilla control efforts, and impact potential changes in water level regulation on water quality and sedimentation are all unknown. Each of these areas is of concern to ecosystem restoration, both within Istokpoga and downstream. Funding for water and sediment quality analysis associated with each task is included in that task. The required funding for the task of assessing water quality will be directed toward development of a nutrient budget, comprehensive analysis of the sediments including benthic invertebrate population, sedimentation rate changes and general sediment quality, and a comprehensive overview of water quality in the lake. Currently, no agency includes funding for a Lake Istokpoga water quality evaluation in its budget.

Aquatic macrophytes, most notably cattails, dominate much of Istokpoga's once sandy shoreline, taking over the shore and inhibiting the maintenance of cypress swamps. Cattails occupy habitat that was once available for spawning, nesting and fishing activities currently limited by monoculture stands of cattails. Selected removal of the cattails would also open areas of the shore to bank fishing by anglers, and enhance riparian property values. The required budget for removal of shoreline aquatic weeds includes funding for aquatic plant surveys, assessment of most appropriate areas for removal and mechanisms for removal, actual opening of shoreline and evaluation of the long-range impact of the activity. Currently, no agency includes funding for large-scale removal of aquatic macrophytes from the Istokpoga shore. Highlands County has included funding for control of macrophytes interfering with navigational access in its FY 1998 budget.

Hydrilla control, discussed in detail in the proposed Hydrilla and Floating Plant Management in the Kissimmee Basin project, is critical to the viability of the Lake Istokpoga ecosystem. When hydrilla is uncontrolled in the lake, Istokpoga serves as a continuous source for the hydrilla throughout the lower portion of the Kissimmee River Basin. Much effort has been expended toward maintenance control of hydrilla and floating aquatic plants in Istokpoga. Stable funding for management of hydrilla is critical to restoration and long-term management of the Lake Istokpoga ecosystem. FDEP has committed $3,500,000 to hydrilla control for FY 1997 and FY1998. Further funding for hydrilla control is not expected from this source. The success of this project is dependent on funding the Hydrilla and Floating Plant Management in the Kissimmee Basin project.

Restoration of natural water level fluctuations is central to the long-term restoration of the Lake Istokpoga ecosystem. Lake Istokpoga is used for water supply, flood control, and recreation; in order to satisfy these project purposes, the existing water management strategy has been to significantly reduce natural water level fluctuations, switching the seasons of highest and lowest water levels for flood control purposes. As noted previously, these stabilized water levels have prevented the seasonal exposure of the shoreline, effected the degradation of the cypress swamp, the growth of tussock islands and the loss of open shoreline to cattails. Additionally, development of tussock islands may significantly impair the flood control capacity of the structures downstream of the lake. During construction of the C&SF Project, not all of the authorized water management features for Lake Istokpoga were built. Therefore, an evaluation of options for completing the authorized project is being considered under the General Reevaluation Report of the USACE. The purpose of the GRR is to evaluate alternatives for operational and / or structural modifications to improve environmental conditions in the lake and to improve flood control while maintaining its authorized project purposes (recreation, water supply and flood control). The water level solution to Istokpoga's woes hinges on restoring more natural water level fluctuations. To date, the USACE has appropriated $405,000 for the GRR portion of this project, with an estimated $600,000 additional required to complete the reevaluation and report on its outcome. The remaining financial requirements for this project include administrative costs of modifying the regulation schedule, evaluations of whether existing flood control is adequate for projected storms given natural water level fluctuations, upgrades as necessary to the flood control system, and environmental monitoring to estimate the effects of changes to the water level fluctuation schedule.

RESTORATION BENEFITS: This project will restore the ecological integrity of the Istokpoga ecosystem by removal of tussock, removal of shoreline cattails, and control of hydrilla, tasks that will improve the diversity of habitat available to native, threatened and endangered species. Restoring more natural water level fluctuations, and the accompanying improvements to the flood control system will help prevent the buildup of tussock islands, the recolonization of shoreline by less desirable species and lead toward restoration of the cypress swamp habitat that has declined since water levels were stabilized. Hydrilla control, funded through another proposed project, is critical to the restoration of both Istokpoga, and the lower Kissimmee River. Continuous assessment of sediment and water quality is essential to ultimately determining the success of this project. The net economic impact of this project may be seen in terms of a more stable sport fishery, development of ecotourism, increased use of Lake Istokpoga by the general public and improved riparian property values.

Time Line and Fiscal Year Budget (in thousands of dollars) for Lake Isokpoga Exosystem Restoration & Mgmt

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
Remove Tussock		750	1250	1000	500	250										3750
Improve H_2O Quality		25	25	25	25	25										125
Remove shoreline aquatic weeds		250	500	2000	500	200										3450
Restore natural level fluctuations		50	100	500	2000	50										2700
Subtotal																**$10,025**

TITLE: Lake Wales Ridge National Wildlife Refuge and CARL Acquisition			
SUBREGION : 1	***PROJECT ID:*** KV03	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:***	State - 50% Federal - 50%	
PROJECT PLAN MANAGER: Johnson	***BASIS:*** 2 and 3	***TOTAL:*** $44,783,000	
LEAD ORGANIZATION(S): USFWS/FDEP		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): The Nature Conservancy		State: $26,486,980	
COUNTY(S): Polk, Highlands, Osceola, Okeechobee		***TOTAL:*** $26,486,980	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to: TS19** **Associated with:**		***TOTAL:*** $18,296,050	
START: 1997	***END:*** Until acquired	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The proposed refuge was authorized in November 1993 and would comprise 21,750 acres in Polk and Highlands Counties. The area forms the headwaters boundary between the Kissimmee River basin and the Peace River basin. It is the oldest terrestrial ecosystem in the southeast region of the US, and is probably the most threatened ecosystem in South Florida due to citrus conversion, residential housing construction, and commercial development. It supports 24 species of endangered, threatened, and candidate plant species as well as four threatened or endangered animal species. 12,861 acres have been acquired to date.

RESTORATION BENEFITS: Acquisition would effect recovery of most of these listed species. The proposed refuge represents the last opportunity to protect these remaining upland habitats in the Kissimmee River drainage. Without these acquisitions, conversion of these lands will probably continue until these habitats completely disappear. Land acquisition began in FY95. Some parcels will be will be managed as conservation easements.

Time Line and Fiscal Year Budget (in thousands of dollars) for																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Preparation																
Implementation																18296
Project																
State																18291
Subtotal																

TITLE: Paradise Run			
SUBREGION : 1	***PROJECT ID:*** KV04	***FINANCIAL REQUIREMENT:*** approx. $12,281,656	
PROGRAM CATEGORY: restoration, acquisition	***BUDGET CATEGORY:*** Land acquisition	***TOTAL:*** approx. $12,281,656	
PROJECT PLAN MANAGER: Rinaldi (561) 687-6537	***BASIS:*** 2,3	***APPROPRIATED TO DATE:*** SFWMD $2,281,656	
LEAD ORGANIZATION(S): SFWMD		**Total $2,281,656**	
SUPPORTING ORGANIZATION(S): FGFWFC		***REMAINING FINANCIAL REQUIREMENT:*** approx. $10,000,000	
COUNTY(S): Glades, Okeechobee		***TOTAL:*** approx. $10,000,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**			
START: FY98	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This 4,265 acre project lies west of canal C-38, between Water Control Structure S-65E and Lake Okeechobee in Glades and Okeechobee Counties. Current land use is predominantly improved pasture and cattle grazing but agricultural activities in the area are intensifying as exemplified by new, nearby row crops (potatoes), sod extraction, and citrus. The remnant river run and adjacent wetlands remain largely intact but have no continuous water flow; hence water quality (especially dissolved oxygen) has become poor and organics have accumulated deeply in the remnant river run. This area consistently has greater wading bird and waterfowl use than most any area of the Kissimmee River. Its close proximity to Lake Okeechobee puts it in foraging flight distance of the large wading bird rookeries. Restoration would be fairly simple because the remnant river run and wetlands are largely intact, and water could gravity flow from Pool E (elevation 21 feet msl) one-half mile to Paradise Run (elevation 16 feet msl). The C-38 canal would be bypassed. At least 2 landowners (John Pearce and John Austin Collier) have expressed an interest in selling their land along Paradise Run.

RESTORATION BENEFITS: Conduct engineering studies to determine feasibility and estimate costs more accurately.

Time Line and Fiscal Year Budget (in thousands of dollars) for Paradise Run

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Studies																300
Land Acquisition																4,700
Construction																5,000
Project																
Subtotal																**$10 ,000**

TITLE: Upper Lakes Basin Watershed			
SUBREGION : *1*	***PROJECT ID:*** KV06	***FINANCIAL REQUIREMENT:*** SFWMD: $30,811,694 Polk County: $7,323,625 ***TOTAL:*** $38,135,319	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition		
PROJECT PLAN MANAGER: Rinaldi (561)687-8537	***BASIS:*** 3	***APPROPRIATED TO DATE:*** SFWMD: $10,904,800 Polk County: $2,325,625 **Total:** *$13,230,519*	
LEAD ORGANIZATION(S): SFWMD			
SUPPORTING ORGANIZATION(S): Polk			
COUNTY(S): Polk, Osceola		***REMAINING FINANCIAL REQUIREMENT:*** SFWMD: $19,904,800 Polk County: $5,000,000 ***TOTAL:*** $24,904,800	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** KV01			
START: 1995	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This 43,500-acre project is located at the headwaters of the Kissimmee-Okeechobee-Everglades ecosystem in Polk and Osceola Counties. The project area includes a substantial portion of Reedy Creek and Lake Marion Creek drainage basins, of which the SFWMD already owns substantial acreage. The land contains large expanses of endangered scrub, mesic and wet flatwoods, hydric hammock, and floodplain forest, including habitat for several threatened and endangered plants and animals. Land management will be carried out by the SFWMD and local Government.

RESTORATION BENEFITS: The primary purpose of this project is to preserve this watershed which is a critical link in the restoration of the Kissimmee-Lake Okeechobee-Everglades-ecosystem. Reedy Creek is the headwater drainage for Lake Russel and Cypress Lake. Peak Discharges from major storm events are modified and stored within the swamp and provide year-round base flow to these downstream lakes. The Lake Marion Creek portion of the project is of critical importance to the recharge of the Floridian Aquifer. Lake Marion serves as the headwaters to Lake Marion Creek, which combines with Snell and Horse Creeks to probed a constant supply of high-quality water to Lake Hatchineha, which in turn discharges to Lake Kissimmee, and eventually the Kissimmee River and Lake Okeechobee. All three of these water bodies are primary components of the SFWMD's water management system.

Time Line and Fiscal Year Budget (in thousands of dollars) for Upper Lakes Basin Watershed																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
Land Acqusition			2100	3000	6000	6000									7800	24900
Subtotal																**$24,900**

TITLE: Kissimmee Prairie Ecosystem			
SUBREGION : 1	***PROJECT ID:*** KV07	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:***	SFWMD: $8,882,950 FDEP: $16,728,340 ***TOTAL:*** $25,611,290	
PROJECT PLAN MANAGER: Rinaldi (561) 687-6537	***BASIS:*** 3	***APPROPRIATED TO DATE*** SFWMD $5,225,450 FDEP: $16,728,340 TOTAL: $21,953,790	
LEAD ORGANIZATION(S): SFWMD			
SUPPORTING ORGANIZATION(S): FDEP			
COUNTY(S): Okeechobee		***REMAINING FINANCIAL REQUIREMENT:*** SFWMD $3,657,500 FDEP $0 ***TOTAL:*** $3,657,500	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**			
START: 1996	***END:*** 1997	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This 46,000 acre project is located in Okeechobee County, east of Canal 38 (the Kissimmee River Channel). Approximately 7,000 acres are within the Kissimmee River Restoration Project and the remaining 39,000 form one of the most unique upland/wetland mosaics in the State. This project area contains 10 separate vegetative community types, all of which are undisturbed that provide breeding habitat for a number of endangered and threatened species.

RESTORATION BENEFITS: The purpose of this land acquisition project is to preserve the unique wetland and dry prairie habitats. Lands associated with the Kissimmee River Restoration Project will be restored to prechannelization hydrologic characteristics, thereby restoring wetland habitat to encourage reestablishment of the historical biological diversity. The remaining 39,000 acres contain extensive wetland habitats and excellent examples of the dry prairie community type which is recognized by the Florida Natural Areas Inventory as endangered at state and global levels. Because of the conversion of similar lands to citrus and improved pasture , this tract is likely the largest and best example of dry prairie habitat remaining in the world. The Kissimmee Prairie Ecosystem , in combination with the adjacent Avon Park Bombing Range and Kissimmee Prairie Audubon Sanctuary, will form the largest region of dry prairie in public ownership in the State, and is the most important step in the recovery of the Federally endangered Florida grasshopper sparrow. Protection of these lands will also protect habitat for the following threatened species: Florida sandhill crane, caracara, Florida scrub jay , and the eastern indigo snake.

STATUS: COMPLETED

Time Line and Fiscal Year Budget (in thousands of dollars) for ***:*** Kissimmee Prairie Ecosystem																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Project																
Land Acquisition															3,700	3,700
Subtotal																**$3,700**

TITLE: Kissimmee Chain of Lakes Drawdown/ Restoration Project			
SUBREGION : 1	***PROJECT ID:*** KV09	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Nat Rest, Hab Enh, Water Qual	Funding contributors include FGFWFC, SFWMD, Osceola and Polk Counties, FDEP, USFWS and USACOE	
PROJECT PLAN MANAGER: Hulon (407)846-5300	***BASIS:*** 2	***TOTAL:*** $32,000,000	
LEAD ORGANIZATION(S): FGFWFC, SFWMD		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): FDEP, USACE, USFWS			
COUNTY(S): Osceola and Polk		***TOTAL:*** 0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:***	
START: 1999	***END:*** 2010	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The Upper Kissimmee Chain of Lakes Restoration Project planned for FY1999-2010 by the Florida Game and Fresh Water Fish Commission (GFC) is anticipated to be a joint cost share project by GFC, South Florida Water Management District (SFWMD) and Osceola and Polk Counties. The project is a continuation of the successful Extreme Drawdown/Habitat Enhancement projects initiated in 1971 by GFC.

The Central and South Florida (CS&F) flood control project resulted in lowered and stabilized water fluctuation schedules for the Kissimmee Chain of Lakes, eliminating the lakes' ability to purge themselves of organics and tussocks by depositing the material on the upland during extreme high water periods. Rigidly stabilized fluctuations result in deterioration of aquatic habitat in the littoral zone and negatively impact both water quality and fish and wildlife habitat. Initial restoration efforts were successful utilizing a simple drawdown, however, ongoing impacts make additional efforts necessary. The shoreline of Lakes Tohopekaliga, Cypress, Hatchineha, Kissimmee, Jackson, Marian and East Lake Tohopekaliga will be restored by mechanical removal of tussocks and organic build-up that can not be remedied with a drawdown alone. The material will be transported to the uplands for disposal where sites are available restoration efforts are required on a 7 to 10 year basis to offset the continuing degradation.

RESTORATION BENEFITS: Positive fisheries responses have been documented for forage and sportfish species following drawdowns and habitat enhancement work. Endangered species such as the Snail Kite, Bald Eagle and the Wood Stork all use restored areas extensively for foraging and nesting in adjacent areas.

Time Line and Fiscal Year Budget (in thousands of dollars) for Lake Tohopekaliga Wetland Restoration Project

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Tohopekaliga																
Cypress & Hatchineha																
Jackson & Marian																
EastTohopekaliga																
Kissimmee																
Project																
Subtotal				10,000		5,000		2,000		5,000		10,000				$32,000

TITLE: Hydrilla and Floating Plant Management in the Kissimmee Subregion			
SUBREGION : Kissimmee	***PROJECT ID:*** KV11	***FINANCIAL REQUIREMENT:*** 50% USACE $20,101 50% DEP $20,101 ***TOTAL:*** $40,202,000	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:***		
PROJECT PLAN MANAGER: Zattau (904) 232-2215	***BASIS:***	***APPROPRIATED TO DATE:***	
LEAD ORGANIZATION(S): USACE, DEP, SFWMD, FGFWFC			
SUPPORTING ORGANIZATION(S): Polk CO., Highlands Co., City of Kissimmee			
COUNTY(S): Orange, Polk, Highlands, Osceola, Okeechobee		***TOTAL:*** 0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** Kissimmee Restoration **Associated with:**		***TOTAL:*** 40,202,000	
START: FY 98	***END:*** FY02	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Implementation of a coordinated program of invasive aquatic plant management throughout the Kissimmee subregion targeting the invasive exotic species hydrilla (Hydrilla verticillata), waterlettuce (Pistia stratiotes), water hyacinth (Eichhornia crassipes). An integrated pest management strategy will be utilized relying on currently proven chemical, mechanical and biological controls in addition to environmental manipulation techiniques. New and/or emerging techniques will also be developed and/or refined to provide the array of management methods necessary to meet program goals. Additional program components are the following delineation of the extent of the invasive populations (DEP), pre- and post-treatment site documentation (DEP, USACE, SFWMD); post- treatment monitoring and control of invasive species regrowth (all); replanting of native species (FGFWFC). The project will begin in FY 98 and continue through FY02. Mission critical projects have navigation, flood control, fish and wildlife habitat, and water delivery impacts while mission essential projects have fish and wildlife habitat, water quality, and regional economic impacts. Floating plants are being maintained at the lowest possible levels in the Butler chain, Upper Basin Lakes, Highlands and Polk Co., C-38 (Kissimmee Canal) and the old oxbows (Old Kissimmee River). Historical funding sources have been US Army Corps of Engineers, Removal of Aquatic Growth (RAG), and the Aquatic Plant Control (APC) Program, and the DEP, Bureau of Aquatic Plant Management. Since FY 96, the APC program was reduced and not funded in FY 97. DEP, Bureau of Aquatic Plant Management has put forth additional funding in FY 96, FY97, and FY 98 to continue maintenance control but expects to have a shortfall in funds in FY 99 if additional funds cannot be secured.

RESTORATION BENEFITS: Hydrilla, introduced into the area during the 1980s, is a submersed exotic that is threatening the basin's water resources. All five of the major lakes in the Upper Basin have experienced typical exponential growth rates of hydrilla that is expected to continue if these areas are not treated. Hydrilla is present in 34 lakes in the subregion. At current population levels, hydrilla poses a serious threat to the ability of water managers to deliver water at desired levels for the purpose of downstream restoration activities and flood control. Large hydrilla populations impact the system in five ways: 1) restricts the flow of water downstream, 2) has the potential to decrease the storage capacity of the system, 3) decreases quality of littoral zones in habitat value and species diversity, 4) negatively impacts the regional economy by decreasing property values and loss of ecotourism revenues, and 5) during high volumes releases hydrillacan be uprooted in large quantities and moved downstream, causing formidable blockages at bridges, locks and flood control structures. The proposed project would manage hydrilla in the Kissimmee subregion to minimize these detrimental effects and allow headwater revitalization and downstream restoration activities and flood control to proceed as planned. Management of hydrilla at low levels would also provide beneficial results to the overall ecology of the area by allowing ecology of the area by allowing the return of more diverse native communities. Floating plants are being kept at the lowest possible levels throughout the system, but in the past had posed serious problems for navigation, flood control, and fish and wildlife habitat. If left uncontrolled, these plants would rapidly multiply and also threaten to block existing bridges, locks, and flood control structures. By using current management techniques, beneficial vegetative communities have been established and caused an increase in native plant and animal diversity.

Time Line and Fiscal Year Budget (in thousands of dollars) for Hydrilla and Floating Plant Management in the Kissimmee Subregion																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Mission Essent		[redacted]														
Mission Critical		[redacted]														
Project																
Mission Essential																
E. Lake Toho		240	250	260	270	280										
L. Cypress		470	490	90	540	90										
L. Hatchineha		740	775	90	850	90										
L. Toho		2030	2125	2225	1640	1640										
Kiss. R.		175	177	179	181	182										
Old Kiss Riv		228	230	232	234	236										
Subtotal		6189	6457	5601	5365	4168										
Mission Critical																
Alligator Lake		51	61	51	76	76										
L. Arbuckle		152	22	22	172	62										
Butler Chain		130	130	130	130	130										
L. Gentry		54	54	54	79	79										
L. Istokpoga		1928	2019	208	2210	208										
L. Jackson		200	50	50	215	90										
L.Marian		240	230	80	270	294										
L.Marion		53	13	328	53	328										
L.. Pierce		68	28	343	68	368										
L. Rosalie		53	53	53	48	78										
L.Walkin		106	56	16	56	256										
Wat.																
Subtotal		3035	2726	1335	3357	1969										
TOTAL		9224	9183	6936	8722	6137										$40,202

3.3 *GREATER LAKE OKEECHOBEE*
Sub-Region 2

ECOLOGICAL SETTING

Subregion 2 includes the Lake Okeechobee, Everglades Agricultural Area (EAA), Caloosahatchee and Upper East Coast basins. Each basin is unique but affected by conditions in the other basins. All have been substantially altered by flood control, drainage and water supply projects. A series of canals, levees, dikes and structures control a large part of the water in this subregion. Except for rainfall, the largest source of water to Lake Okeechobee comes from the Kissimmee River.

LAKE OKEECHOBEE BASIN

The Lake Okeechobee basin includes Lake Okeechobee, Fisheating Creek, Taylor Creek, Nubbin Slough, the Indian Prairie and Harney Pond Canals and the area that drains to each of those water bodies in Martin, Okeechobee, Highlands, Glades, Hendry and Palm Beach Counties. Drainage from Clewiston and adjacent agricultural areas enters the lake through the Industrial Canal and the S-4 Pump Station. As part of the flood control system, eight pump stations on the south rim of the lake also periodically backpump water into the lake from a portion of the EAA. Except for Fisheating Creek, all of the lake's tributaries have been channelized with flows controlled by either pump stations or gated structures.

The lowering of its water level and the construction of an encompassing dike have modified Lake Okeechobee. These actions reduced its size and isolated it from its original extensive, dynamic system of littoral zone and floodplain. As a result of the managed water levels that existed between the early 1950s to the late 1970s, a new diverse 150 square mile marsh formed within the now well-defined 730 square mile lake.

Although the current configuration of the lake was designed primarily to provide drainage, flood control and water supply benefits, the relatively shallow water of the lake and new littoral marsh provide a major wildlife habitat for wading birds, waterfowl and other wildlife, including a number of federal and state listed species. During droughts, the lake ecosystem serves as a regional refuge for many types of birds. Lake Okeechobee is a major recreational resource that provides opportunities for hunting, boating, ecotourism and is a renowned freshwater fishing area. It also supports a commercial fishing industry. The Okeechobee Waterway, a Corps of Engineers (COE) maintained navigational route which crosses the lake, extends 152 miles from the Gulf of Mexico at Fort Myers to the Atlantic Ocean at Stuart.

A COE adopted lake regulation schedule is a compromise between the demand for high lake levels for water supply and lower levels which will provide storage capacity to protect the watershed from flooding during tropical storms. During dry periods, the shallow lake can hold sufficient water to serve as a backup water recharge source for the Biscayne Aquifer and a large part of the surficial aquifer in Palm Beach County. Together these aquifers serve the 4.5 million people and agricultural needs in Southeast Florida. Environmental water releases can be made through the main canal system to the Water Conservation Areas.

By far, the single largest demand on Lake Okeechobee is to provide water for agricultural irrigation in the EAA south of the Lake and in the St. Lucie and Caloosahatchee basins. Land to the north also receives irrigation water. Five communities withdraw drinking water directly from the lake. The City of Fort Myers depends upon the lake to ensure the quantity and quality of the supply of drinking water it withdraws from the Caloosahatchee River. In the future, maintenance of minimum flows and levels within the downstream natural system will place additional demands on the lake. Urban demands are also expected to steadily increase.

EVERGLADES AGRICULTURAL AREA BASIN

The 700,000-acre (1,100 square mile) EAA lies between Lake Okeechobee and the Water Conservation Areas (WCAs). The area was originally part of the sawgrass dominated Everglades. A broad pond apple forest existed along the south shore of the lake. Water flowed out of the lake through stream channels in the natural muck berm formed by the pond apple forest. During periods of high water, sheetflow occurred over the entire southern rim of the lake.

Near the end of the last century and the beginning of this century, efforts were begun to lower the water level in Lake Okeechobee and to drain the Everglades. These efforts attracted settlers to the area south of the lake to farm the organic soils. A muck levee was constructed on the southern side of Lake Okeechobee to provide flood protection to residents. Although the Everglades Drainage District constructed levees, locks, dams and 440 miles of canals, flooding from the hurricane of 1928 killed over 2000 people in the EAA.

In 1930, the Federal Government became involved and construction of the Herbert Hoover Dike around Lake Okeechobee began. In the following years, over drainage during droughts caused coastal salt water intrusion and muck fires in the Everglades while hurricanes continued to result in property damage. As a result of these conditions, the U. S. Army Corps of Engineers (COE) was authorized to create the present Central and South Florida Flood Control Project.

Soils in the EAA support about 550,000 acres planted in sugarcane, vegetables, rice and sod. Water levels within the EAA are managed through a system of canals, structures, and pumps that facilitate flood control and irrigation. The area includes rural communities with a total population of about 55,000 people. EAA canals and flooded fields serve as habitat for wading birds, migratory shore birds and other biota, including listed species such as the wood stork. At the southern end of the EAA there are about 68,000 acres that were impacted by drainage and are now managed for recreational activities. On most of this property, hydrologic restoration is either under way or planned.

CALOOSAHATCHEE BASIN

This basin includes the Caloosahatchee River watershed in Glades, Hendry, Lee, and Charlotte Counties; and the Caloosahatchee Estuary on which the cities of Fort Myers, and Cape Coral are located. The Caloosahatchee Estuary, Pine Island Sound, Matlacha Pass and San Carlos Bay in Lee County are included in the lower Charlotte Harbor Estuary as part of the National Estuarine Program. The remaining northern portions of the Charlotte Harbor Estuary in Charlotte County into which the Peace and Myakka Rivers discharge are under the jurisdiction of the Southwest Florida Water Management District. Five national wildlife refuges, four State aquatic preserves and two State land preserves are part of the area included in this National Estuary Program. The system provides habitat for over 30 protected species and supports highly productive fisheries.

The southwest coastal portion of this basin is an area experiencing rapid population growth. The basin has a high rate of land conversion to agriculture, primarily citrus. This is the result of the movement of citrus farming to Southwest Florida following several severe freezes in Central Florida in the mid-1980s.

The slash pine forests of southwest Florida have been identified as an endangered ecosystem. Within this basin are areas of hydric pine flatwoods, which have significant ecological and hydrological value. Plant species diversity is high, with over 900 species, including 85 protected species. At least 21 Federal and State listed animal species are supported by the flatwoods communities which are also important to ground-water recharge.

UPPER EAST COAST BASIN

The Upper East Coast Basin forms the northeastern portion of the South Florida ecosystem. It includes St. Lucie, Martin, and northern Palm Beach counties. Basin physiography is dominated by a ridge and swale, terrace and bar topography that has

created the coastal barrier islands, Indian River Lagoon, Atlantic Coastal Ridge, and western flatlands.

This variation in topography has given rise to a diversity of habitats, ranging from rich estuarine seagrass beds to xeric coastal scrub, extensive pine flatwoods, and depressional freshwater wetlands. These habitats support several listed species, including West Indian manatee, Florida scrub jay, gopher tortoise, red-cockaded woodpecker, and Florida sandhill crane. The coastal estuarine lagoon system is an important resource of aesthetic, economic, recreational, and biological value. Significant areas within this basin are included in the Indian River Lagoon National Estuary Program. The Indian River Lagoon is the most diverse estuary in the U. S., with more than 4,300 species of plants and animals, including 36 that are rare and endangered.

The Atlantic Coastal Ridge is the most densely settled part of the basin. Extensive areas are in agricultural production, primarily citrus and vegetable crops. The barrier islands alternate between park lands and developed areas, especially in Palm Beach County

Two river systems, the St. Lucie and Loxahatchee Rivers, breach the Coastal Ridge to drain the western flatlands. Portions of both rivers have been channelized, and the St. Lucie River has been directly connected via the St. Lucie Canal, to Lake Okeechobee. A major canal system has been constructed in Martin and St. Lucie Counties which has increased the size of the drainage basin for both the St. Lucie River system and the Indian River Lagoon. As a result, inflows of freshwater have been altered in quantity, quality and timing. Ecosystem disruption and environmental damage have resulted.

The North Fork of the St. Lucie River, however, is designated a State Aquatic Preserve and Outstanding Florida Water as are portions of the Loxahatchee River. A portion of the Northwest Fork of the Loxahatchee River is also Florida's only federally designated Wild and Scenic River and the largest surviving sub-tropical cypress forest river system in the United States. The Loxahatchee Slough, a headwater of the Loxahatchee River system, is a mosaic of pine flatwoods, cypress forest, and wet prairie. This is a critical area for storage of wet season rainfall and also receives pumped drainage from portions of its watershed. It serves as a drinking water reservoir for the City of West Palm Beach and its water utility service area and provides aquifer recharge for other wellfields in northeastern Palm Beach County.

LINKAGE TO THE TOTAL SYSTEM

Greater Lake Okeechobee Subregion 2 is central to the management of water in the South Florida Ecosystem. It is a major hydrological crossroads that has become increasingly important as the natural flow of water through the ecosystem has been altered. Nutrient loads from the Kissimmee River and Subregion 1 affect Lake Okeechobee. Degradation of water quality occurring within Subregion 2 impacts subregions down stream. Water that enters the subregion from rainfall and the Kissimmee River Subregion is managed primarily for economic purposes. Releases from the lake are made to the north, east, west or through multiple outlets to the south depending on water supply needs.

When available, water from the subregion can be sent south to downstream subregions. Some of these releases are environmentally beneficial and necessary. Drainage discharges can also disrupt the normal volume and timing of water moving through the natural system. Occasionally, increased volumes of water entering the WCAs has contributed to the flooding of tree islands, the drowning of deer, the flooding of alligator nests and the disruption of wading bird nesting. Nutrients carried in drainage, primarily from subregion agricultural areas have caused vegetative changes in downstream natural areas.

LAKE OKEECHOBEE BASIN

Lake Okeechobee is the third largest lake located entirely in the United States and has become the central hydrologic component of the South Florida ecosystem. Highly regulated for purposes of flood control,

irrigation, water supply, and recreation, water management decisions have adversely impacted its natural resources and effects on downstream resources have also been significant. During periods of abundant rainfall, when lake levels threaten its ability to also serve as a flood control buffer, water which under natural conditions would have overflowed to the Everglades is now shunted to the estuaries on the east and west coasts.

EVERGLADES AGRICULTURAL AREA BASIN

At certain times of the year, the EAA is primarily dependent on Lake Okeechobee for water supply and the WCAs for disposal of drainage water. Under certain conditions, water can also be withdrawn from the WCAs for EAA water supply and Lake Okeechobee can also receive EAA drainage discharges. This dependence of the EAA upon outside areas for flood control results in the untimely delivery of water and in the loss of the natural sheet flow of water entering the north end of the WCAs. In addition to quantity impacts, these discharges to both the lake and WCAs carry with it water quality impacts. Increased EAA water supply demands during drought conditions reduces the water available to downstream natural areas and magnifies drought impacts.

CALOOSAHATCHEE BASIN

The Caloosahatchee River Basin is linked to the total system through Lake Okeechobee by an unnatural connection constructed during the late 1800s. The water needs of the basin's growing population and the expanding agriculture industry are impacting Lake Okeechobee and reducing water available to meet the natural system needs of other downstream subregions. The largest volumes of regulatory releases from the Lake are made to and disrupt the Caloosahatchee Estuarine system. Under natural conditions, this water would have overflowed the lake to what is now the EAA and downstream subregions. The Charlotte Harbor estuarine system is also affected by inflows in the northern half of the basin that are not under control of the SFWMD.

UPPER EAST COAST BASIN

The Upper East Coast basin also has man-made hydrological connections to Lake Okeechobee and the Everglades Agricultural Area via the St. Lucie Canal (C-44) and the West Palm Beach Canal (C-51). Regulatory and flood control water releases from these basins directly impact the estuaries and groundwater resources of this basin while diverting the water from its natural flow path into downstream subregions. C-51 Canal discharges have had a quantity and quality impact on the Lake Worth Lagoon in the Lower East Coast Subregion.

These direct connections also create additional water supply demands on Lake Okeechobee, which reduce the water available to downstream subregions. The Upper East Coast Basin will also affect the water quality and quantity of WCA-1 (Arthur R. Marshall Loxahatchee National Wildlife Refuge) when runoff from the C-51 basin is back-pumped into STA-1E. . Redesign of the Western C-51 Basin Project by the Corps of Engineers will allow storage of larger quantities of water and reduction of the amount released to Lake Worth, while still providing flood protection to developed areas of the C-51 basin

ECOSYSTEM PROBLEMS AND RESTORATION OBJECTIVES

To restore the Greater Lake Okeechobee Subregion, the problems of the unnatural timing and quantity of the water entering, within, and leaving the subregion must be solved. Excess lake water releases which are currently discharged to the east and west coasts disrupt the ecology of the estuaries. Additional water storage is needed to restore natural hydropatterns such as more natural water deliveries to the Everglades. Any solution must also protect the lake from prolonged periods of high and low water.

Water quality is a major concern throughout the subregion. Problems caused by pollutants such as mercury, dissolved solids, sediment transport, and nutrients especially phosphorus have affected the majority of subregion water bodies. These water quality problems are also discharged to other subregions.

LAKE OKEECHOBEE BASIN

Ecosystem problems in Lake Okeechobee are primarily a result of nutrient runoff from ranching, dairy, and agricultural lands; a lake regulation schedule which places water supply and flood control concerns ahead of the ecological health of the lake; and the invasion by exotic plants. Nutrient enrichment has caused major alterations in the ecology of the Lake. Algal blooms affect the lake on a regular basis. Major increases have occurred in the populations of blue-green algae and pollution-tolerant benthic animals.

Alteration of native littoral zone plant communities is linked to several factors. Since the native plant community developed under low nutrient conditions, the present high nutrient content of lake water has altered parts of that community. Cattails have expanded greatly over the last few decades. Prolonged high lake water levels suppress annual plant reproduction and impact the willow community, both of which are important to wildlife.

There has also been a major invasion of exotic plants. Melaleuca has spread over thousands of acres of marshland; torpedo grass has covered large expanses of the native moist soil plant community; while water hyacinths have proven to be a threat to navigation. Proliferation of various exotic species demands on-going remedial actions as well as research to improve control agents and methods. Because current control methods can also cause environmental problems, an increased effort to develop biological control methods is needed.

Special attention is focused on reducing excessive nutrient loading from the agricultural areas north of the Lake. Since the 1970s, agricultural activities, including dairy and beef cattle ranching, have been recognized as sources of excessive phosphorus loading to the Lake and the probable cause of accelerated eutrophication. There have been major efforts to reduce phosphorus loads and significant progress has been made, particularly in reducing loading from dairies. However, with the average annual phosphorus load to the lake currently exceeding the target by about 100 tons a year, much work remains to be done.

An evaluation has been initiated to identify sources and cleanup options for problem dairies. . Research also is being conducted to quantify the amount of phosphorus load reduction that might be achieved by the removal of contaminated sediments from ditches and canals in the watershed. An effort to restore overdrained wetlands in the basin might also prove to be very beneficial. Additionally, under a cooperative program with the University of Florida and Archbold Biological Station, research is being conducted to identify and optimize beef cattle ranching practices that will reduce nutrient loads in stormwater runoff and drainage discharges. The long-term goals of this project are to optimize beef cattle BMPs to ensure both economically and environmentally sustainable beef cattle practices communicate these optimized BMPs to ranchers and enhance a beef cattle management decision support system.

A goal of achieving more natural flows from the Lake into the Everglades and other parts of the natural system, including a reduction of the unnatural flow of water to the east and west coast estuaries, is critical to restoration success. Success in these efforts would provide significant ecological and commercial benefits far beyond the shores of Lake Okeechobee. However, the true test of the restoration effort will be its ability to achieve this goal while also reducing current lake high water level impacts and improving the ecological health of the lake. This restoration effort must include methods and locations for the storage of excess water outside of the lake and subregion.

EVERGLADES AGRICULTURAL AREA BASIN

Soil subsidence, caused primarily by microbial oxidation of organic matter under aerobic conditions, is a major ecological issue in the EAA. Not only does it cause the loss of a valuable resource, it also degrades water quality. Although drainage has caused significant subsidence over a 50-year period (at an average rate of 1.2 inches per year),

improvements in water table management have effectively reduced this rate to about 0.56 inches per year.

The most practical method to reduce subsidence is to maintain water levels as close to the soil surface as possible. The more soil within the profile that is inundated, the less oxidation occurs. Growers have already made important changes by including rice in their sugarcane rotations, thus increasing the use of summer flood waters and growing crops at higher water tables. These techniques help control subsidence and permit more water storage in the EAA. Limited research to breed and select sugarcane cultivars adapted to higher water tables urgently needs to be expanded. Profitably growing sugarcane at higher water tables in the EAA is critical to both sustaining production and allowing the EAA to contribute positively to the ecology of other areas.

The quality of drainage water released from the EAA to the WCAs, including the Loxahatchee National Wildlife Refuge, has been a significant issue that has received more attention than other EAA related issues. Three major programs are in place to lower the phosphorus content of EAA drainage water. They are: (1.) use of on-farm Best Management Practices to treat water before it leaves the farms; (2.) the Everglades Nutrient Removal Project (ENR), a 3,800 acre prototype STA between sugarcane fields and the Refuge and (3.) design of up to 40,000 acres of Stormwater Treatment Areas (STAs).

The amount of phosphorus that can be released to the WCAs without unbalancing the system is still controversial and yet to be determined through ongoing research. However, through two of the three programs mentioned above, improvements are already being achieved as is illustrated below:

- Between May 1, 1996 and April 30, 1997, on-farm BMPs reduced the annual average EAA phosphorus load to the WCAs by 50%.
- Between June 1996 and June 1997, the ENR project reduced the concentration of inflow phosphorus approximately 80% before outflow into the Refuge.

The STAs will be large constructed wetlands that will receive stormwater runoff from the EAA and provide water quality treatment through natural processes before the water enters the WCAs. They will also help to redistribute the current unnatural point source discharges to a more natural sheet flow. It is unclear whether they alone will be able to meet the very low levels of phosphorus required to maintain a healthy Everglades. Several advanced treatment technologies are currently being investigated for use as a final treatment process.

Five small scattered areas next to the lake backpump drainage water directly into the lake. This water is high in nitrogen, adds additional phosphorus and at times, violates other water quality standards such as total dissolved solids, dissolved oxygen, specific conductivity, chlorides, un-ionized ammonia and others. Current plans will divert about 80% of this water to the STAs for treatment. During times of excessive rainfall, the pump stations S-2 and S-3 backpump water of similar quality from the major canals in the EAA into the lake. In the Clewiston area, the Industrial Canal and S-4 Pump Station also discharge to the lake.

CALOOSAHATCHEE BASIN

Originally, the Caloosahatchee River was a shallow, meandering stream with headwaters at the marshes in and around Lake Hicpochee. Drainage and navigation efforts resulted in the channelization of the stream and its connection to Lake Okeechobee. Over a number of decades, residential, commercial and agricultural development in the basin has resulted in the destruction of natural resources including the filling of wetlands, clearing of forests and the lowering of the ground water table over a large area. Development of the basin has also lead to an increase in nutrient loading to the basin's aquatic systems. Drainage has caused high volume, damaging discharges to the estuary during the wet season and unnaturally low flows during the dry season. High flow problems are compounded by periodic, large-volume regulatory releases from Lake Okeechobee. Such extremes threaten oyster bars, seagrass beds, the associated

benthic community and the area's ability to serve as an estuarine nursery.

The Charlotte Harbor estuarine ecosystem has experienced significant habitat loss and water quality degradation over the last 30-50 years due to human activity in the basin. Seagrass and saltmarsh acreage decreased 29 and 51 percent, respectively, from 1945 to 1982. Nutrients, especially nitrogen, entering the estuary have been increasing for the past 15-20 years.

Conversion of uplands and pasture lands to citrus farming is expected to continue. There is concern about potential effects on plants, wildlife, and their habitats and on surface and groundwater quality. Additional irrigation and drainage demands cause concern over the potential impacts on water-table levels.

Slash pine forest ecosystem acreage in Southwest Florida has steadily declined. Large acreage's of hydric pine flatwoods have been lost to logging, development, and agriculture activities. Habitat destruction from residential and commercial development and citrus conversion continues. Melaleuca and other invasive exotic plants are a serious ecological problem.

UPPER EAST COAST BASIN

Alterations in hydrology have been the major problem in the Upper East Coast Basin. Much of the natural area of the Upper East Coast was first converted to citrus groves and cattle range and pasture. Now urban development is rapidly expanding westward into these rural areas and increasingly fragmenting and eliminating natural communities.

Estuarine hydrology has been severely affected by construction of the drainage canal system, artificial stabilization of ocean inlets, development of the Intracoastal Waterway, and construction of causeways across the lagoons. Terrestrial hydrology has been affected by the drainage works, which shorten and sharpen hydroperiods. Abrupt flood-control pulses of fresh water released from water management canals to Lake Worth and the Indian River Lagoon threaten estuarine productivity. A planned divide structure in the L-8 Canal will send additional water into Lake Okeechobee instead of into WCA 1, the Loxahatchee Slough or the Lake Worth Lagoon. During periods of abundant rainfall, this additional water will increase high lake stage and estuarine discharge impacts.

Long-range urban expansion plans threaten the Loxahatchee Slough. A series of land purchases through the Save Our Rivers program, the Palm Beach County Environmentally Sensitive Lands Program will preserve some additional areas within the Loxahatchee Slough system from development and offers the potential of restoration of hydrologic and habitat continuity in the watershed.

RESTORATION OBJECTIVES:

The critical restoration objectives for the Greater Lake Okeechobee Subregion have been identified by the Working Group and are listed as follows:

- Restore more natural hydrologic conditions with appropriate levels, flows, timing and dynamic storage to reduce related ecological stress while managing water resources to meet multipurpose demands.
- Eliminate harmful discharges while restoring natural flows to east and west coast estuaries.
- Protect the ecological function of the Lake Okeechobee littoral zone.
- Develop and implement a management plan for the southern islands in Lake Okeechobee which will maximize natural system benefits.
- Reduce nutrient inputs to natural areas to pre-disturbance levels.
- Improve or maintain water quality necessary for healthy natural system function.
- Manage water and nutrients to sequester in-place Hg.

- Reestablish and maintain recreational and commercial fisheries.

- Eliminate or minimize habitat loss and degradation and restore degraded habitats.

- Restore overdrained and degraded wetlands.

- Eliminate or drastically reduce the presence of exotic plants in the natural areas of the subregion and control their spread.

- Develop sustainable agriculture that controls soil subsidence and takes advantage of natural weather patterns and hydrology.

- Further reduce phosphorus loads from the EAA through reduction in soil oxidation and implementation of BMPs. Construct STAs and use other necessary mechanisms to reach nutrient levels consistent with environmental needs.

RESTORATION PROJECTS

Important restoration projects in progress or proposed for the Greater Lake Okeechobee Subregion 2 are identified on the following pages:

TITLE: Herbert Hoover Dike Stabilization			
SUBREGION: 2	***PROJECT ID:*** GL01	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Infra Invest	USACE: $250,000,000	
PROJECT PLAN MANAGER: K. Brooks-Hall 904-232-3155	***BASIS:*** 3	***TOTAL:*** $250,000,000	
LEAD ORGANIZATION(S): USACE		***APPROPRIATED TO DATE:*** USACE: $3,448,000	
SUPPORTING ORGANIZATION(S): SFWMD			
COUNTY(S): Okeechobee, Martin, Palm Beach, Hendry, Glades		***TOTAL:*** $3,448,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** TS01, GL03		***REMAINING FINANCIAL REQUIREMENT:*** ***TOTAL:*** $246,552,000	
START: 1995	***END:*** 2006	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The purpose of the project is to protect the structural integrity of the Herbert Hoover Dike during extreme high water conditions. Construction of the Herbert Hoover Dike around Lake Okeechobee was initiated in the early 1930's and the last features were completed in the 1970's. The levee was constructed and improved through an incremental process during this period. Based on the best available existing data, it appears that the levee does not meet current safety factors for extreme flood conditions. Geotechnical data are being collected and evaluated to determine the extent of the problem and to develop recommendations for corrective actions. The results will be documented in a Major Rehabilitation Report. Construction cost may be incurred between 2000-2006. Note: Construction cost may be cost shared.

RESTORATION BENEFITS: This project will contribute to the restoration of Lake Okeechobee and more natural water flows to the estuaries and the Everglades by avoiding operational constraints that would reduce the ability to meet restoration goals. If the Herbert Hoover Dike is not stable under high water conditions, it may be necessary to modify the operation of the project to minimize the probability of experiencing high water conditions. Such operations could dictate when and how much water is released from the lake. As a result, operational flexibility would be lost and restoration opportunities would be reduced.

Time Line and Fiscal Year Budget (in thousands of dollars) for Herbert Hoover Dike Stabilization																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
USACE	349	330	400	5,000	15,000	20,000	20,000	20,000	15,000	15000						Unsched
Subtotal																**246,552**

TITLE: Fisheating Creek			
SUBREGION : 2	***PROJECT ID:*** GL02	***FINANCIAL REQUIREMENT:*** SFWMD $5,000,000	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition		
PROJECT PLAN MANAGER: Rinaldi	***BASIS:*** **3**	***TOTAL:*** $5,000,000	
LEAD ORGANIZATION(S): SFWMD		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): FDEP			
COUNTY(S): Glades		TOTAL: $5,000,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***REMAINING FINANCIAL REQUIREMENT:*** SFWMD $5,000,000 ***TOTAL:*** $5,000,000	
START: 1997	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Fisheating Creek, the only free- flowing tributary to Lake Okeechobee, is an extensive riverine swamp flowing through Glades County and emptying into the Lake. The total project area is 43,872 acres. Currently, none oft his acreage is in public ownership. The project area contains relatively undisturbed upland and wetland habitats that serve as habitat for the endangered Florida Panther and a number of threatened species, including the Florida black bear, the bald eagle, the Florida scrub jay, and the Florida sandhill crane. The federally listed wood stork and state listed white ibis are known to use the area.

RESTORATION BENEFITS: This acquisition will preserve the water quality and critical habitat of this large watershed. Additionally, the acquisition will provide both hydrologic and water quality benefits for Lake Okeechobee, located downstream. When stages in Lake Okeechobee are high, Fisheating Creek serves as an important feeding area for wading birds, which typically use the lake marshes. Restoration requirements would be minimal if any, as most of the property remains in a natural state.

Time Line and Fiscal Year Budget (in thousands of dollars) for Fisheating Creek

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Land Acquisition																
Project																
SFWMD			5000													5000
Subtotal																**$5,000**

TITLE: Lake Okeechobee Regulation Schedule Review			
SUBREGION : 2	***PROJECT ID:*** GL03	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Area Mgt	USACE: $697,000	
COUNTY (S): K. Brooks-Hall 904-232-3155	***BASIS:*** 2	***TOTAL:*** $697,000	
LEAD ORGANIZATION(S): USACE		***APPROPRIATED TO DATE:*** USACE: $578,000	
SUPPORTING ORGANIZATION(S) : SFWMD			
PROJECT PLAN MANAGER: Okee, Martin, Palm Beach , Hendry, Glades		***TOTAL:*** $578,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** TS01, GL01, GL31		***REMAINING FINANCIAL REQUIREMENT:*** ***TOTAL:*** $119,000	
START: 1996	***END:*** 1998	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The operational guidelines for Lake Okeechobee are being reviewed to attempt to optimize the natural resources within the Lake, water discharges to the Everglades, and flows to the estuaries without adversely impacting flood control or municipal or industrial water supply.

RESTORATION BENEFITS: The purpose of the study is to develop a new operating strategy for Lake Okeechobee to improve the environmental conditions within the Lake, provide non-damaging discharges to the estuaries, and improve the timing and volumes of flows to the estuaries. The project is authorized and funding is available.

Time Line and Fiscal Year Budget (in thousands of dollars) for Lake Okeechobee Regulation Schedule Review																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
USACE	155	119														119
Subtotal																**119**

TITLE: Buck Island Agroecology Study			
SUBREGION : 2,1	***PROJECT ID:*** GL04	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Water quality/habitat protection		
PROJECT PLAN MANAGER: Steinman (561) 687-6492	***BASIS:*** 2 Ecosystem Restoration	***TOTAL:***	$12,000,000
LEAD ORGANIZATION(S): SFWMD		***APPROPRIATED TO DATE:*** since 1991	
SUPPORTING ORGANIZATION(S): IFAS, NRCS, FCA, Archbold, MacArthur Foundation, USEPA, FDEP		MacArthur/Archbold 20-year lease value SFWMD, IFAS, FDEP, private contributions ***TOTAL:***	$4,000,000 $2,000,000 $6,000,000
COUNTY(S): Highlands		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to:** GL06, GL07 **Associated with:**		***TOTAL:***	$6,000,000
START: 1991	***END:*** 2010	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Agricultural development in the Lake Okeechobee watershed has had major ecological impacts on both the lake and watershed regions. North of the lake, cattle and dairy farms have imported as much as 5400 tonnes phosphorus yr^{-1} into the watershed as feed and fertilizer. Best management practices (BMPs) have resulted in dramatic declines in phosphorus (P) runoff from agricultural sites around the lake and phosphorus loading to the lake has been reduced by nearly 40%. However, the target load of approximately 360 tonnes P per year adopted by the State of Florida has not yet been achieved, and there is a need for additional reduction of P input into Lake Okeechobee. With completion of the programs to improve water quality associated with dairy runoff, beef cattle ranching becomes the next logical source in attempts to limit nutrient input into Everglades/Okeechobee ecosystem.

Under a cooperative agreement between the SFWMD, the University of Florida's Institute of Food and Agricultural Science (IFAS), Archbold Biological Station, and the Florida Cattlemen's Association, experimental research is being conducted to identify and optimize beef cattle ranching practices that will reduce nutrient loads in stormwater runoff. This project involves field-scale experimental research conducted over a range of hydrological and ranch management conditions to ensure that results can be realistically applied to agricultural operations in the basin. Three primary management practices will be optimized in this program: cattle stocking rate; pasture fertilization practices; and grazing and cattle rotation schemes. Specific components of the research include: (1) evaluation of water quality, nutrient cycling, and habitat attributes of existing pasture land management practices; (2) development of BMPs of cow-calf production systems in south Florida and assessment of their impact on water quality and wildlife habitat; and (3) dissemination of information about BMPs to regional cattle producers.

RESTORATION BENEFITS: Immediate benefits include improved water quality of runoff from pasture and range lands. Additional restoration benefits include improved wildlife habitat within improved pastures and wetlands of south Florida watersheds. Improved cattle management practices combined with enhanced water quality and wildlife functions provide a foundation for restoration of many south Florida watersheds, water bodies, and connecting streams and wetlands, including the Kissimmee River, Lake Okeechobee, St. Lucie River, Caloosahatchee River, Charlotte Harbor, C-139, Big Cypress Basin, and the Everglades.

Time Line and Fiscal Year Budget (in thousands of dollars) for Buck Island Agroecology Study																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
	500	500	500	500	500	500	500	500	500	500	400	400	200			6,000
Subtotal																**$6,000**

TITLE: Lake Okeechobee Water Retention/Phosphorus Removal			
SUBREGION : 02	***PROJECT ID:*** GL06	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Water Quality	Federal	$6,000,000
		State/local/landowners	$6,000,000
PROJECT PLAN MANAGER: Rosen (561) 687-6348	***BASIS:*** 2	***TOTAL:***	$12,000,000
		APPROPRIATED TO DATE:	
LEAD ORGANIZATION(S): SFWMD		SFWMD	$325,000
SUPPORTING ORGANIZATION(S): FDEP, FDACS, NRCS, SWCD, Landowners		***TOTAL:***	$325,000
COUNTY(S): Okeechobee, Highlands, Glades, St. Lucie		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:**			
Critical to: TS1-I			
Associated with: TS5-M,LO4-S		***TOTAL:***	$12,000,000
START: 1997	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The purpose of this project is to increase regional water storage north of Lake Okeechobee, reduce phosphorus loading to the lake, and restore wetland habitat in the region. This project covers approximately 25% of the watershed located north of Lake Okeechobee. Project elements will range in size from an entire sub-basin to localized efforts to reduce surface water runoff. Wetlands account for between 18 and 25% of the land classification in this watershed (based on data from US Fish and Wildlife Service-National Wetlands Inventory); however, approximately 45% of the wetlands have been ditched to dry the land for agriculture (i.e., improved pasture). Many of these wetlands were isolated depressions that functioned as small water retention areas in the landscape. Others were more expansive and experienced drying from the regional drainage system. The current system causes the loss of water from the watershed as surface water runoff, which is rapidly transported to the tributary system that drains into Lake Okeechobee. This project would reduce the number of drained wetlands in the northern watershed of Lake Okeechobee, as well as create new ones to retain/detain the water in the watershed (potentially 20,000 acres). The slow release of water from these wetlands will restore the natural hydrology through ground water recharge and attenuation of peak flows. For the ditched wetlands, the approach will be to simply remove the connection between the wetlands and the ditch, leaving the drainage system in place. At the subbasin scale, large land parcels that were once part of the tributary system's historic flood plain will be reflooded. In addition to water storage, these wetlands would remove nutrients and restore wildlife habitat. Additional water quality benefits would come from isolating phosphorus-loaded wetlands, increasing the buffer zones, and riparian corridors adjacent to waterways.

RESTORATION BENEFITS: The restoration of wetlands in the northern watershed of Lake Okeechobee will provide peak flow attenuation of water to the lake, resulting in a more gradual rise in lake stage during heavy rainfall periods, and a slower drop in lake stage during drought. Fewer freshwater discharges to tide from the Caloosahatchee and St. Lucie canals, dictated by the Lake Okeechobee regulation schedule, would be anticipated, as well as a reduction in nutrient loading to the lake. Regional benefits to wildlife and waterfowl are anticipated from these restored wetlands.

Time Line and Fiscal Year Budget (in thousands of dollars) for Lake Okeechobee Water Retention/Phosphorus Removal

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Construction Plan		■														
Construction			■	■	■											
Project																
Construction Plan		650														650
Construction			3783	3783	3783											11,350
Subtotal		650	3783	3783	3783											12,000

TITLE: Lake Okeechobee Tributary Sediment Dredging			
SUBREGION : 02	***PROJECT ID:*** GL07	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure/Management	***BUDGET CATEGORY:*** Water Quality	Federal $1,900,000 State/local $1,900,000	
PROJECT PLAN MANAGER: B. Rosen. SFWMD (561)687-6348	***BASIS:*** 2	***TOTAL:*** $3,800,000	
LEAD ORGANIZATION(S): SFWMD		***APPROPRIATED TO DATE:*** (initial study funded by SFWMD for $168,000)	
SUPPORTING ORGANIZATION(S): FDEP, FDACS, NRCS, SWCD, Landowners		***TOTAL:*** $150,000	
COUNTY(S): Okeechobee, Highlands, Glades, St. Lucie		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to:** GL06 **Associated with:** TS05, KV01		***TOTAL:*** $3,800,000	
START: 1997	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Sediments in tributaries to Lake Okeechobee are an important source of phosphorus that contribute to the over-target loading to the lake. A recently completed study indicated that 800 tons of phosphorus are contained in tributaries within an 8-basin area that encompasses the most intense agriculture in the northern watershed of the lake. The tributaries in this study range in size from primary to tertiary canals and field ditches. Although our knowledge on the transport of these sediments to the lake is limited at present, it is certain that high flow conditions will mobilize a portion of the sediments. Sediments were found to have the highest concentration of phosphorus in the upper 6 inches, and are located predominately in the primary and tertiary canals (80% of the 800 tons). The project proposes dredging sediments from these canals, thereby removing them as a potential source of phosphorus to Lake Okeechobee.

RESTORATION BENEFITS: The phosphorus loading to Lake Okeechobee would be reduced, enhancing the ability for the in-lake phosphorus target of 40 mg/L to be achieved more rapidly. The improvement in Lake Okeechobee water quality will enhance all water uses south of the lake, as well as the estuaries receiving water from the lake.

Time Line and Fiscal Year Budget (in thousands of dollars) for Lake Okeechobee Tributary Sediment Dredging

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Detailed site Assessments																
Dredging																
Project																
		300	1,750	1,750												3,800
Subtotal																**$3,800**

TITLE: West Palm Beach Wetland Reclamation Project			
SUBREGION : 2	***PROJECT ID:*** GL08	***FINANCIAL REQUIREMENT:*** Proposed	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Water Quality/Habitat Protection	Local: 50 percent Federal: 50 percent	
PROJECT PLAN MANAGER: Erik Olson (561) 659-8085	***BASIS:*** Farm Bill Priority: 23	***TOTAL:*** $34,219,973	
LEAD ORGANIZATION(S): City of West Palm Beach		***APPROPRIATED TO DATE:*** Local: $6,682,516 Federal: $0 ***TOTAL:*** $6,682,516.00	
SUPPORTING ORGANIZATION(S): SFWMD			
COUNTY(S): Palm Beach		***REMAINING FINANCIAL REQUIREMENT:*** Local: $10,427,471 Federal: $17,109,987 ***TOTAL:*** $27,537,458.00	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**			
START: 1996	***END:*** 1999	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project will reuse safe, highly treated wastewater to increase the water supply in South Florida while lowering the demand on existing potable water resources including Lake Okeechobee. The plan involves directing the flow of tertiary treated wastewater through restored and created wetlands for additional cleansing and treatment processes, and at the same time creating wetland habitat. Then the water will be directed to the surficial aquifer where it will be recovered and pumped into the City of West Palm Beach's M Canal, which flows to the water treatment plant. The City of West Palm Beach, Florida, with support from Palm Beach County and the South Florida Water Management District, is implementing a wetlands-based Water Reclamation Program. This will assist the City and County in achieving sustainability while providing water for Everglades restoration.

RESTORATION BENEFITS:

1. Providing water for Everglades restoration through elimination of withdrawals from Lake Okeechobee for drinking water needs - a benefit of 60 - 100 million gallons per day.
2. Creation and restoration of approximately 2,000 acres of environmentally sensitive wetlands.
3. Increased water availability for meeting long-term urban water supply demands in the City of West Palm Beach, the Town of Palm Beach, and central Palm Beach County.
4. Aquifer recharge and replenishment.
5. Retention, conservation, and utilization of 30 million gallons per day of high quality reclaimed water.
6. Reduction of quantity of water disposed in deep injection wells.
7. Reduction of stormwater discharge to tide.

NOTE: The City has already expended almost $4 million to acquire the land and to conduct the pilot program.

Time Line and Fiscal Year Budget (in millions of dollars) for West Palm Beach Wetland Reclamation Project

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Phase I	■															
Phase II A, B & C	■															
Phase III A	■															
Phase III B		■														
Phase III C		■	■													
Project																
County	1000	2120	2120													5,240
City	2000	2880	2880													7,760
City/SFWMD																4,219
EPA	5000															5,000
Other Federal	0	6000	6000													12,000
Subtotal																**34,219**

TITLE: Atlantic Ridge Ecosystem			
SUBREGION : 2	***PROJECT ID:*** GL09	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	SFWMD: $27,000,000 FDEP: $27,000,000	
PROJECT PLAN MANAGER: Rinaldi (561) 687-6537	***BASIS:*** 3	***TOTAL:*** $54,000,000	
LEAD ORGANIZATION(S): SFWMD		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): FDEP		SFWMD: $7,500,000 FDEP: $7,500,000	
COUNTY(S): Martin		***TOTAL:*** $15,000,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** None **Critical to:** None **Associated with:** None		SFWMD: $19,500,000 FDEP: $19,500,000	
		TOTAL: $39,000,000	
START: 1996	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The project area is located in southern Martin County, between I-95 and U.S. 1. The project area includes approximately 12,700 acres, which is extremely diverse ecologically. It contains large areas of forested sloughs and high quality flatwoods, as well as one of the largest remaining islands of coastal scrub. The current land use is mostly cattle grazing on unimproved pasture with intense agriculture and residential development occurring around the edges of the project area. However, the project also contains extensive wetland and upland systems. Currently, none of this project is in public ownership.

RESTORATION BENEFITS: The purpose of this project is to conserve and protect the high quality habitats and to protect water quality of the South Fork of the St. Lucie River and the North Fork of the Loxahatchee River. The project area forms the headwaters to these rivers and the extensive wetland systems provide a source of groundwater base flow to both rivers. This project will conserve and protect significant habitat for endangered and threatened species such as the Florida scrub jay, the Florida sandhill crane, and the Florida scrub lizard. The area is extremely important for aquifer recharge and water supply to the coastal portion of Martin County.

Time Line and Fiscal Year Budget (in millions of dollars) for Atlantic Ridge Ecosystem

Task	1998	1999	2000	2001	2002	Unprog	Total
Land Acquisition	15.0	10.0	9.6	10.0	9.4	--	54.0
Project							
Subtotal							

TITLE: Indian River Lagoon			
SUBREGION : 2	***PROJECT ID:*** GL10	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	**SFWMD** $8,736,940 **Counties:** $2,566,290 **CARL** $12,833,230 **FED:** $1,530,000 ***TOTAL:*** $25,666,460	
PROJECT PLAN MANAGER: Rinaldi (561) 687-6537	***BASIS:*** 2	***APPROPRIATED TO DATE:***	
LEAD ORGANIZATION(S): SFWMD		**SFWMD** $1,747,387 **Counties:** $1,490,758 **CARL** $1,589,143 **FED:** $301,000 ***TOTAL:*** $5,128,288	
SUPPORTING ORGANIZATION(S): St. Lucie and Martin Counties, FDEP and FW			
COUNTY(S): St. Lucie		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with** GL19		**SFWMD** $6,989,553 **Counties:** $1,075,532 **CARL** $11,244,087 **FED:** $1,229,000 ***TOTAL:*** $20,538,172	
START: 1997	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project consists of two tracts on Hutchinson Island, in St. Lucie County, totaling 535 acres. Currently, none of this acreage is in public ownership. Approximately 87% of the two tracts are wetlands, dominated by red and black mangroves, with a few freshwater wetlands.

RESTORATION BENEFITS: This acquisition is part of a larger effort by several counties in both the SFWMD and St. Johns River WMD to protect, preserve and restore the Indian River Lagoon. These lands represent the only two undeveloped parcels along the Indian River in St. Lucie County that are not in public ownership. Mosquito control impoundments are present on both tracts. Public ownership of these parcels would allow installation of operable water control structures that allow flushing of the mosquito control impoundments during most of the year. This flushing will provide an important source of mangrove detrital matter which is critical to the health of the estuary. Public ownership will also prevent aerial applications of chemical pesticides for mosquito control.

In 1997, protection was expanded to include lands in Martin County as well.

Time Line and Fiscal Year Budget (in millions of dollars) for Indian River Lagoon

Task	1998	1999	2000	2001	2002	Unprog	Total
Land Acquisition	5.1	--	--	7.0	7.0	6.5	25.6
Project							
Subtotal							

TITLE: Juno Hills			
SUBREGION : 2	***PROJECT ID:*** GL11	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	State and Local	
PROJECT PLAN MANAGER: John Outland (904) 488-4892	***BASIS:*** 1, and 3	***TOTAL:*** $19,479,343	
LEAD ORGANIZATION(S): FDEP		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): Palm Beach County		State and Local $14,975,430	
COUNTY(S): Palm Beach		***TOTAL:*** $14,975,430	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** Continuation of FDEPs CARL Acquisition and Palm Beach County's EEL Program **Critical to:** **Associated with:**		***TOTAL:*** $4,503,913	
START: 1997	***END:*** 1997	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This 440-acre site in Palm Beach County contains one of the largest and best remaining examples of the now rare coastal scrub. The extremely rare four-petal pawpaw, known only from a few sites in the Southeast Florida coastal scrub, and at least three other rare species of scrub plants occur in the Juno Hills project. Such rare animals as the scrub jay, scrub lizard, gopher tortoise, and red widow spider also inhabit the scrub here. Scrubby slash pine flatwoods, disturbed basin swamps, and estuarine tidal swamps cover parts of the project area.

RESTORATION BENEFITS: This acquisition will preserve a sample of the original vegetation of the Atlantic Coastal Ridge in densely populated southeast Florida. The land will be used as a park/botanical site.

TITLE: Loxahatchee River			
SUBREGION : 2	***PROJECT ID:*** GL12	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	**SFWMD** $11,927,120	
PROJECT PLAN MANAGER: Rinaldi (561) 687-6537	***BASIS:*** 3	***TOTAL:*** $11,927,120	
LEAD ORGANIZATION(S): SFWMD		***APPROPRIATED TO DATE:*** **SFWMD** $11,927,120	
SUPPORTING ORGANIZATION(S) : Palm Beach County			
COUNTY(S): Palm Beach**,** Martin		***TOTAL:*** $11,927,120	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** GL19		***TOTAL:*** $0	
START: 1984	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This 1,936-acre project connects to the southern end of Jonathan Dickinson State Park, and contains lands in Palm Beach and Martin Counties. The project includes the historic floodplain of the Northwest Fork of the Loxahatchee River, a National Wild and Scenic River.

RESTORATION BENEFITS: The purpose of this project is to protect the outstanding natural and cultural values of Florida's only federally designated Wild and Scenic River. Public ownership of this property will prevent direct disruption of surface and groundwater flows to the Northwest Fork, and increase minimum flows to the Loxahatchee River which will affect downstream movement of the saltwater wedge during dry conditions.

ACQUISITION STATUS: Completed.

TITLE: Loxahatchee Slough			
SUBREGION : 2	***PROJECT ID:*** GL13	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	Palm Beach County: $16,000,000 SFWMD: $5,000,000	
PROJECT PLAN MANAGER: C. Rinaldi (561) 687-6537	***BASIS:*** 2	***TOTAL:*** $21,000,000	
LEAD ORGANIZATION(S): SFWMD, Palm Beach County		***APPROPRIATED TO DATE:*** Palm Beach County: $13,000,000 SFWMD: $4,000,000	
SUPPORTING ORGANIZATION(S) : None		***TOTAL:*** $17,000,000	
COUNTY(S): Palm Beach		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: Dependent on: None **Critical to:** None **Associated with:** None		Palm Beach County: $3,000,000 SFWMD: $1,000,000 ***TOTAL:*** $4,000,000	
START: 1996	**END:** 2002	**APPROVED:** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The Loxahatchee Slough Project is located in Palm Beach County and covers approximately 13,900 acres. It contains a mixture of habitat types, including pine flatwoods, cypress forest, and wet prairie. The present land use is native range. These lands are adjacent to the Loxahatchee Slough Corridor, an area that has been pledged for protection by the current landowner. Palm Beach County will lead the land management effort for this project.

RESTORATION BENEFITS: The purpose of this project is to provide additional wetland and upland buffer to the Loxahatchee Slough Corridor and to preserve critical foraging and nesting sites for wildlife in an area that is undergoing rapid urban development. This system is important for storing surface water runoff and providing groundwater base flow to Canal 18 and the Loxahatchee River. The slough, which is the initial headwaters of the Loxahatchee River, can also spill over to the south and contribute to the Everglades watershed under certain hydrologic conditions.

NOTE: Palm Beach County purchased 10,300 acres of this project in 1996.

Time Line and Fiscal Year Budget (in millions of dollars) for Loxahatchee Slough

Task	1998	1999	2000	2001	2002	Unprog	Total
Land Acquisition	4.0	4.0	--	--	--	--	8.0
Project							
Subtotal							

TITLE: North Fork St. Lucie River			
SUBREGION : 2	***PROJECT ID:*** GL14	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	St. Lucie County: $2,800,000 FDEP: $3,500,000 SFWMD: $5,332,000	
PROJECT PLAN MANAGER: C. Rinaldi (561) 68706537	***BASIS:*** 3	***TOTAL:*** $11,632,000	
LEAD ORGANIZATION(S): SFWMD		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S) : St. Lucie County, FDEP		St. Lucie County: $1,200,000 FDEP: $1,417,000 SFWMD: $2,000,000	
COUNTY(S): St. Lucie		***TOTAL:*** $4,617,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** GL19		St. Lucie County: $1,600,000 FDEP: $2,083,000 SFWMD: $3,332,000 ***TOTAL:*** $7,015,000	
START: 1995	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This 2,800-acre project includes a stretch of the North Fork approximately 6 miles long, extending from the White City bridge to Canal 24. This project will extend the boundary of the existing publicly owned St. Lucie River Aquatic Preserve. More than 80 percent of the project area is comprised of wetlands within the river floodplain. In addition to the river floodplain, this project includes 175 acres of high quality uplands habitat such as high hammock, pine flatwoods, and sand pine scrub.

RESTORATION BENEFITS: The purpose of this project is to preserve the floodplain habitat and to protect the water quality of the St. Lucie River from the rapidly encroaching urban development. Floodplain wetlands help decrease current velocities in the river, thereby attenuating flood waters. This action also facilitates recharge of the surficial aquifer and filters out nutrients, pollutants and suspended solids. This stretch of the river is classified as an Outstanding Florida Water. Boating, fishing and canoeing are actively pursued on this part of the river.

Time Line and Fiscal Year Budget (in millions of dollars) for North Fork St. Lucie River

Task	1998	1999	2000	2001	2002	Unprog	Total
Land Acquisition	3.0	1.0	--	3.0	3.0	--	10.0
Project							
Subtotal							

TITLE: North Savannas			
SUBREGION : 2	***PROJECT ID:*** GL15	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	St. Lucie County: $1,200,000 SFWMD: $3,800,000	
PROJECT PLAN MANAGER: Rinaldi (561) 687-6537	***BASIS:*** 3	***TOTAL:*** $5,000,000	
LEAD ORGANIZATION(S): SFWMD		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S) : St. Lucie County		St. Lucie County: SFWMD:	
COUNTY(S): St. Lucie County		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** None **Critical to:** None **Associated with:** None		St. Lucie County: $1,200,000 SFWMD: $3,800,000 ***TOTAL:*** $5,000,000	
START: 1997	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Currently, none of this acreage, which contains a 930-acre remnant of the historical savannas community type in St. Lucie County, is in public ownership. Based on an evaluation conducted for the Florida Natural Areas Inventory, this area was found to have excellent natural community diversity. Seven upland and wetland community types, including a small area of sand pine scrub, are on the property. Important water management functions of this project area include attenuating peak discharges during major storm events and water quality improvement. The site promotes recharge to the surficial aquifer, which is the primary source of potable water in St. Lucie County. The water table at this location is extremely shallow and results in the aquifer being vulnerable to surface contamination.

RESTORATION BENEFITS: Acquisition of this land will help in promoting recharge and protection of the surficial aquifer from surface contamination. Once acquired, sheetflow would be improved if several shellrock roads were removed. Further, acquisition will conserve and protect feeding and breeding habitat for a number of endangered and threatened species, including the wood stork, the Florida sandhill crane, and the osprey. This site also includes the world's only known population of an undescribed mint plant (*Dicerandra sp.*).

Time Line and Fiscal Year Budget (in millions of dollars) for North Savannas

Task	1998	1999	2000	2001	2002	Unprog	Total
Land Acquisition	--	1.1	--	1.5	2.4	--	5.0
Project							
Subtotal							

TITLE: Pal-Mar				
SUBREGION : 2	***PROJECT ID:*** GL16	***FINANCIAL REQUIREMENT:***		
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	SFWMD:	$7,000,000	Palm Beach Cty: $4,500,000
		Martin County :	$1,000,000	FDEP: $11,500,000
PROJECT PLAN MANAGER: Rinaldi (561) 687-6537	***BASIS:*** 3	***TOTAL:***	$24,000,000	
		APPROPRIATED TO DATE:		
LEAD ORGANIZATION(S): SFWMD		SFWMD:	$3,500,000	Palm Beach Cty: $2,000,000
SUPPORTING ORGANIZATION(S) : DEP, Palm Beach & Martin Counties		Martin County :	$1,000,000	FDEP: $4,500,000
COUNTY(S): Palm Beach, Martin		***TOTAL:***	$11,000,000	
		REMAINING FINANCIAL REQUIREMENT:		
LINKED PROJECTS: **Dependent on:** None		SFWMD:	$3,500,000	Palm Beach Cty: $2,500,000
Critical to: None		Martin County :	-0-	FDEP: $7,000,000
Associated with: None		***TOTAL:***	$13,000,000	
START: 1997	***END:*** 2002	***APPROVED:*** 11/97		***LAST REVISION:*** 2/98

DESCRIPTION: Pal-Mar is located in Palm Beach and Martin Counties, east of the J.W. Corbett Wildlife Management Area and west of Jonathan Dickinson State Park. The total project encompasses 37,314 acres, including some of the highest quality pine flatwoods in southern Florida in an ecotone between pine flatwoods and the treeless Everglades. It also includes high quality prairie and savanna habitat. The first purchase of 1,922 acres was completed in 1992.

RESTORATION BENEFITS: The primary purpose of this project is to conserve and protect environmentally unique lands that contain native, relatively unaltered flora and fauna. Acquisition of this project will form an extensive wildlife corridor connecting Jonathan Dickinson State Park, Pal-Mar, J.W. Corbett Wildlife Management Area, and DuPuis Reserve. By protecting native flatwoods, prairies, and marshes, this project will protect critical habitat for at least four endangered bird species, including the Florida sandhill crane and Everglades snail kite, and for the endangered Florida panther.

Time Line and Fiscal Year Budget (in millions of dollars) for Pal Mar

Task	1998	1999	2000	2001	2002	Unprog	Total
Land Acquisition	9.5	6.0	4.0	2.0	1.0	--	22.5
Project							
Subtotal							

TITLE: South Fork St. Lucie River			
SUBREGION : 2	***PROJECT ID:*** GL17	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	**SFWMD** $2,480,000	
PROJECT PLAN MANAGER: Rinaldi (561) 687-6537	***BASIS:*** 3	***TOTAL:*** $2,480,000	
LEAD ORGANIZATION(S): SFWMD		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S) : FDCA		**SFWMD** $2,480,000	
COUNTY(S): Martin		***TOTAL:*** $2,480,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $0	
START: 1995	***END:*** 1996	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project includes 184 acres on the western shore of the upper South Fork St. Lucie River. The property begins approximately 0.75 miles south of State Road 76 and extends approximately 1.25 miles southward.

RESTORATION BENEFITS: The purpose of this project is to protect the integrity of the river corridor. River water quality is best maintained when river corridor lands remain in their natural state and are restored and managed to enhance natural community quality. Prescribed fire has successfully been used as the main restoration tool to improve the condition of degraded communities on this property.

ACQUISITION STATUS: Completed.

-*TITLE: Indian River Lagoon National Estuary Program			
SUBREGION : 2	***PROJECT ID:*** GL18	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** **Natural Res. Mngt.**	USDA: $1,700,000 **IFAS 300,00**	
PROJECT PLAN MANAGER: Donna Smith - 561-461-4546	***BASIS:*** 3	***TOTAL:*** $2,000,000 (funded)	
LEAD ORGANIZATION(S): IFAS/ES		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S) : NRCS			
COUNTY(S): St. Lucie, Martin		***TOTAL:*** $500,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $1,500,000	
START: 1997	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Addressing water quality quantity concerns in the Indian River Lagoon Estuary through the development and implementation of water management plans. This project includes the Florida Yards neighborhoods program, establishment of BMP's to curtail nutrient flows into the Indian River Lagoon, assistance with urban landowners to prevent pollution and the operation of two mobile irrigation labs to assist Agricultural and Urban water users reduce water consumption.

RESTORATION BENEFITS: This project reduces water consumption in the basin from agriculture and urban areas and nutrient loading in to the Indian River Lagoon Estuary from urban and agricultural areas.

Time Line and Fiscal Year Budget (in thousands of dollars) for Indian River Lagoon National Estuary Program																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
IFAS (funded)		60	60	60	60	60										300
NRCS (funded)		220	230	240	250	260										1,200
Subtotal																**1,500**

TITLE: Indian River Lagoon Restoration Feasibility Study			
SUBREGION : 3	***PROJECT ID:*** GL19	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Management	USACE $3,075,000 SFWMD $3,075,000	
PROJECT PLAN MANAGER: Hornung, 561-687-6616	***BASIS:***	***TOTAL:*** $6,150,000	
LEAD ORGANIZATION(S): USACE		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): SFWMD		USACE $ 872,700 SFWMD $ 872,700	
COUNTY(S): St Lucie, Martin		***TOTAL:*** $1,745,400	
LINKED PROJECTS: **Dependent on:** **Critical to:** TS01 **Associated with:** GL10, GL14, GL18		***REMAINING FINANCIAL REQUIREMENT:*** Funding included in Comp Restudy, TS1-I USACE $2,202,300 SFWMD $2,202,300 ***TOTAL:*** $4,404,600	
START: 1997	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Indian River Lagoon spans some 156 miles along Florida's Central East Coast. With limited flushing capability with ocean waters, the ecology of the lower one-third of the lagoon is heavily influenced by freshwater discharges from the C&SF Project canals. Today, high-volume freshwater flows to the St. Lucie estuary through canals constructed as part of the C&SF Project cause rapid decreases in salinity in the St. Lucie estuary and Indian River Lagoon, adversely affecting the health of the habitats and organisms in these coastal estuaries. The C&SF Project canals and water control structures were designed to improve drainage for agricultural, industrial, and residential use. These drainage modifications and land use intensification in the St. Lucie estuary watershed have dramatically increased wet-season flows to the estuary and significantly reduced dry-season inflows. The Indian River Lagoon Restoration Feasibility Study is the second feasibility study to be initiated under the C&SF Project Comprehensive Review Study authority. The study will develop a regional plan to address multiple water resource opportunities to include: environmental restoration of areas adversely impacted by the C&SF Project system; flood damage reduction; and urban and agricultural water supply.

RESTORATION BENEFITS: In 1991, the Indian River Lagoon was listed as an estuary of national significance and included in the National Estuary Program. The restoration of base flow to the estuary will improve salinity conditions for habitats and organisms dependent on brackish areas for at least part of their life cycle. Reduction in the frequency of high volume stormwater discharges will reduce rapid fluctuations of salinity as well as sedimentation, thereby improving conditions for oyster communities and seagrass beds. Upland detention of stormwater will also decrease nutrient loading which has contributed to the build-up of fine-grained nutrient-rich muck in the estuary. Concepts to be evaluated during the study to meet the restoration objectives for the St. Lucie estuary and the Indian River Lagoon include the construction of water preserve areas to attenuate stormwater flow-ways which divert stormwater to other areas, localized retention facilities, and the feasibility of removing organic sediments from the St. Lucie estuary. The project is authorized and a Feasibility Cost Sharing Agreement is scheduled to be executed by the USACE and the SFWMD in June 1996.

Time Line and Fiscal Year Budget (in thousands of dollars) for Indian River Lagoon Restoration Feasibility Study																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
USACE	776	1409	531	219	43											2,978
SFWMD	776	1409	531	219	43											2,978
Subtotal																**5,956**

TITLE: Upper East Coast Regional Attenuation Facilities/Water Preserve Areas			
SUBREGION : 3	***PROJECT ID:*** GL21	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	State - Federal cost-share: 50/50 (Proposed)	
PROJECT PLAN MANAGER: Warner	***BASIS:***	***TOTAL:*** $80,000,000	
LEAD ORGANIZATION(S): SFWMD (Proposed by Governor's Commission)		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S):			
COUNTY(S): Martin, St Lucie, Okeechobee		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $80,000,000	
START: 1996	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Involves acquiring approximately 40,000 acres of land in Martin, St. Lucie, and Okeechobee counties. Identification of exact parcels will come as a result of completion of the Indian River Lagoon (IRL) Restoration Feasibility Study. These lands will be used for stormwater storage facilities. The need for storage was established by the Indian River Lagoon SWIM Plan and adopted into the USACE's Restudy effort. Excess stormwater is routed to the St. Lucie estuary and Indian River Lagoon, where it disrupts natural salinity conditions and aquatic habitats. Much of the land is in citrus production, and because citrus farming in this area is not expanding, the lands may be purchased at favorable prices. An increase in the citrus market (up somewhat in 1996) would escalate land prices and bring pressure to convert more native and pasture land to citrus production. Rapid acquisition will facilitate design by reducing the number of alternatives to be considered.

RESTORATION BENEFITS: Detention will improve the quantity and timing of discharges to the IRL and the St. Lucie estuary, and will improve the quality of discharges by reducing the concentration of nutrients and other pollutants. Another probable benefit is improved agricultural water supply.

NOTE: This land may be incorporated into recommendations of the Indian River Lagoon Feasibility Study, which will be initiated July 1996. If the recommended plan requires acquisition of these lands, the SFWMD will be given credit for their cost.

TITLE: Agricultural Contributions to Carbon Cycling			
SUBREGION : 2	***PROJECT ID:*** GL22	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research	ARS $1,797,980	
PROJECT PLAN MANAGER: L.H. Allen (352) 392-6180	***BASIS:*** 3	***TOTAL:*** $1,797,980	
LEAD ORGANIZATION(S): USDA-ARS		***APPROPRIATED TO DATE:*** ARS $359,596	
SUPPORTING ORGANIZATION(S):			
COUNTY(S): All		***TOTAL:*** $359,596	
LINKED PROJECTS: **Dependent on:** GL40 **Critical to:** **Associated with:**		***REMAINING FINANCIAL REQUIREMENT:*** ARS $1,438,384	
		TOTAL: $1,438,384	
START: 1996	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Measure methane, carbon dioxide, and water fluxes of rice, sugarcane, and wetland species under various water table conditions in order to identify species and cultivars that will most likely thrive under flooding and soil waterlogging. Measure transmissibility of oxygen and methane flow through the aerenchyma of rice, sugarcane, and wetland species downwards to the rhizosphere and soil.

RESTORATION BENEFITS: Provide information on the effect of various vegetation cover and water table management on loss of organic matter as soil carbon dioxide fluxes. This will enable management practices that will sustain productivity while helping to reserve the organic soil resources of the Everglades. Provide information on species and cultivars that will thrive but under flooding and waterlogging conditions while minimizing organic loss.

Time Line and Fiscal Year Budget (in thousands of dollars) for Agricultural Contributions to Carbon Cycling

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Research																
Project																
ARS	360	360	360	360	360											1,800
Subtotal																$1,800

TITLE: Ecological Impact of Water Resource Project for Ten Mile Creek Property			
SUBREGION : 3	***PROJECT ID:*** GL23	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Monitoring	UF/IFAS: $2,725,000 USDA/NRCS: $400,000	
PROJECT PLAN MANAGER: Arnold (561) 468-3922	***BASIS:***	***TOTAL:*** $3,125,000	
LEAD ORGANIZATION(S): IFAS, NRCS		***APPROPRIATED TO DATE:*** Potential Cost Sharing Partner: SFWMD	
SUPPORTING ORGANIZATION(S): Harbor Branch Oceanographic Institute		***TOTAL:*** $0	
COUNTY(S): Saint Lucie, Martin		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** GL10, GL19 **Critical to:** **Associated with:** GL18		***TOTAL:*** $3,125,000	
START: 1997	***END:*** 2007	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project will be in support of the Save Our Rivers Water Resources Project Application for Ten Mile Creek Property. The object of this project is to provide baseline data of plant, wildlife, and water quality and document changes in these parameters through the construction and operational phases of the Ten Mile Creek Project. A pre-construction wildlife and plant census will document the existing ecosystem. The wildlife and vegetation census will be repeated following construction to document the transition from grove/pasture to a reservoir/attenuation facility. The water monitoring portion of the project will record inflows, rainfall, and evaporation and seepage estimates so that water balances can be calculated for the Ten Mile Creek project. A major focus of the project will be to determining the environmental aspects of the project brought about by changes in the water flow patterns in the Ten Mile Creek basin. Wetland hydro periods calculated from depth/duration measurements will be evaluated with respect to project operation. Measurements of nutrient and pesticide concentrations in the waters and sediments of the creek, wetlands, and reservoir will document the effectiveness of the Ten Mile Creek project to enhance the quality of water going into the Indian River Lagoon.

RESTORATION BENEFITS: This project will provide valuable long-term measurements of changes in water flows, water quality, and wildlife and plant populations as the land area changes from agriculture to a reservoir/attenuation facility. The project will provide data to document the Ten Mile Creek Project's impact as part of the Indian River Lagoon restoration. These data may also be used to evaluate similar future projects that are considered.

Time Line and Fiscal Year Budget (in thousands of dollars) for Ten Mile Creek Ecological Impact Project

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Wildlife census	■	■		■				■			■					
Plant census	■	■		■				■			■					
Monitor water	■	■	■	■	■	■	■	■	■	■	■					
Project																
IFAS/NRCS	250	250	250	250	375	250	250	375	250	250	375					3,125
Subtotal																**$3,125**

TITLE: L-8 Canal - Water Catchment Area - Loxahatchee Slough Infrastructure Improvements			
SUBREGION : 2	***PROJECT ID:*** GL24	***FINANCIAL REQUIREMENT:*** (Proposed)	
PROGRAM CATEGORY: Infrastructure Investment	***BUDGET CATEGORY:*** Infrastructure Investment	Federal $1,600,000 WPB $1,600,000	
PROJECT PLAN MANAGER: Erik Olson (561) 659-8085	***BASIS:***	***TOTAL:*** $3,200,000	
LEAD ORGANIZATION(S): City of West Palm Beach		***APPROPRIATED TO DATE:*** Local $500,000	
SUPPORTING ORGANIZATION(S):			
COUNTY(S): Palm Beach		***TOTAL:*** $500,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** GL26		***REMAINING FINANCIAL REQUIREMENT:*** Federal $1,600,000 WPB $1,100,000 ***TOTAL:*** $2,700,000	
START: 1997	***END:*** 1998	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Infrastructure improvements to take water from L-8 Canal and route it to the City of West Palm Beach's Water Catchment Area and then into the Loxahatchee Slough and Estuary

RESTORATION BENEFITS: Will directly benefit approximately I0,000 acres of wetlands in the Loxahatchee Slough; provide additional flow for restoration of the Loxahatchee River Estuary; provide additional water for I0,000 acres of wetlands in the City's Water Catchment Area: reduce dependency on Lake Okeechobee water: provide water for storage in Aquifer Storage and Recovery wells for later environmental and urban water supply use.

Time Line and Fiscal Year Budget (in thousands of dollars) for L-8 Canal - Water Catchment Area - Loxahatchee Slough Infrastructure Improvements

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Improvements																
Project																
Federal	250	1350														1,600
WPB	250	1350														1,600
Subtotal	500	2700														$3,200

TITLE: Ten Mile Creek Water Preserve Area			
SUBREGION : 2	***PROJECT ID:*** GL25	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition & Infrastructure	***BUDGET CATEGORY:*** Land Acquisition & Infrastructure	USACE SFWMD & Local Sponsors	$15,000,000 $15,000,000
PROJECT PLAN MANAGER: Unsell (561)687-6888	***BASIS:*** 2	***TOTAL:***	$30,000,000
LEAD ORGANIZATION(S): USACE, SFWMD		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): National Estuary Program, Regional Attenuation Facility Task Force, St. Lucie River Initiative		***TOTAL:***	$0
COUNTY(S): Martin and St. Lucie		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to:** UEC12-M **Associated with:** UEC11-M, UEC16-S		***TOTAL:***	$30,000,000
START: 1996	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This is a land acquisition and infrastructure project. It will consist of the acquisition of 1200 to 2000 acres of land in the eastern portion of the Ten Mile Creek Basin and the construction of an above-ground impoundment for stormwater detention purposes on this property. It will also include construction of one or more pump stations and may require redesign and reconstruction of the adjacent tidal discharge control structure. A constructed wetland or flow-through marsh may be added for water quality improvement purposes.

This project may be the first of several similar water preserve areas in Martin and St. Lucie counties. It will be very important to the construction and long-term operation of these other facilities that as much as possible can be learned from this first preserve area. Pre-construction habitat and vegetative systems will be documented for permit purposes and for the assessment of benefits of the facility. Water quality and quantity monitoring will be initiated prior to construction as well. Use of this baseline data will guide staff in optimizing the operation of this facility. Factors to be considered will be local habitat creation and restoration as well as the benefits that will occur downstream in the Lagoon and Estuary.

RESTORATION BENEFITS: Major improvements will accrue to the North Fork of the St. Lucie River Estuary, which is a part of the Indian River Lagoon, as a result of this project. The Indian River Lagoon is the most biologically diverse estuary in North America. The entire lagoon is endangered, especially the southern portion lying in SFWMD, from increased freshwater run-off from watershed drainage enhancements. Control of freshwater entering this basin will allow salinity concentrations to stabilize to levels that are favorable to seagrasses and benthic organisms such as oysters. Sediments and nutrients in the freshwater discharges to the estuary will also be reduced through this proposed detention system. Reduction in pollutants such as nutrients and excessive freshwater discharges will result in improvements in habitat for manatees and a host of saltwater fishes that use the estuary and lagoon as nurseries. Organic ooze is an ongoing problem in the estuary, especially in the North Fork. The reduction in sediment loadings that occurs with the construction of this proposed facility is anticipated to provide substantial relief from this long-term problem.

TITLE: Loxahatchee Slough Ecosystem Restoration			
SUBREGION : 03	***PROJECT ID:*** GL26	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure & Management	***BUDGET CATEGORY:*** Infrastructure Investment, Natural Resource Management		
PROJECT PLAN MANAGER: Lund (SFWMD), (561) 687-6631 Brennan (PBC) (561) 233-2494	***BASIS:*** 2 Ecosystem Restoration	***TOTAL:*** $2.05 million ***APPROPRIATED TO DATE:***	
LEAD ORGANIZATION(S): SFWMD, Palm Beach County DERM, USACE			
SUPPORTING ORGANIZATION(S): City of West Palm Beach		***TOTAL:*** $0	
COUNTY(S): Palm Beach		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		Estimated cost of ogee weir/single gate structure: $1-1.25 million Estimated treatment costs for1800 acres melaleuca: $0.8 million ***TOTAL:*** $2.05 million	
START: 1997	***END:*** 2000	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This ecosystem restoration project has two components; the construction of a new water control structure in the C-18 canal to permit reflooding of Loxahatchee Slough wetlands previously drained by construction of the C-18 canal, and the elimination of approximately 1800 acres of melaleuca infestation associated with over-drained wetlands in the Loxahatchee Slough. The structure will raise water levels in the east leg of the C-18 canal to permit hydroperiod restoration for approximately 12,000 acres of the adjacent Loxahatchee Slough. This area proposed for hydroperiod restoration and exotic plant removal was purchased by Palm Beach County in 1996 as part of its Environmentally Sensitive Lands Acquisition Program. The Loxahatchee Slough is currently drained to elev. 15.0' by the C-18 canal. This proposed structure will permit management of some 12,000 acres to wet seasonal highs of about 18', while still maintaining flood protection for surrounding developed lands in the C-18 basin. In addition to environmental benefits, the project also enhances groundwater recharge for two major water supply utilities. Hydroperiod enhancement of this area was proposed in a USACE Environmental Assessment of the Loxahatchee Slough completed in 1983. The hydraulic and hydrologic models necessary for structure design are currently under construction as part of a $300,000 cooperative agreement between the SFWMD and the City of West Palm Beach. Model work will be completed in FY98, including structure. Funding for structure construction is targeted for FY99. Maleleuca eradication is planned for FY98-FY99 to allow substantial completion prior to reflooding of the Slough.

RESTORATION BENEFITS: This project will provide immediate benefits to the Loxahatchee Slough, Loxahtchee River, and Loxahatchee River estuary. Ecosystem benefits include 1.) restoration of native vegetation, including improvement of snail kite habitat in the Loxahatchee Slough, 2.) reduction in excessive water losses associated with transpiration by melaleuca, 3.)restoration of natural hydroperiod to 12,000 acres of Loxahatchee Slough; 4.) delivery of critical minimum flows to the Northwest Fork of the Loxahatchee River (Florida's only federally designated Wild and Scenic River) which cannot currently be guaranteed from existing C-18 canal storage and 5.) reduction in adverse stormwater releases to the Loxahatcee River estuary via the Southwest Fork which are associated with existing drainage practices.

Time Line and Fiscal Year Budget (in thousands of dollars) for Loxahatchee Slough Ecosystem Restoration

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Melaleuca Erad.																
Model Dev.																
Altern./Design																
Construction																
Levee Gaps																
Project																
SFWMD			600													600
City WPB	100	150	150													400
PB County	100	150	750													1,000
USACE																
Subtotal																**$2,000**

TITLE: Cypress Creek Restoration Project			
SUBREGION : 2	***PROJECT ID:*** GL28	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure, Land Acquisition	***BUDGET CATEGORY:*** Infrastructure, Land Acquisition		
PROJECT PLAN MANAGER: Sexton (The Conservation Fund)	***BASIS:*** 2	***TOTAL:*** $15,000,000	
LEAD ORGANIZATION(S): DCA		***APPROPRIATED TO DATE:*** SL Lucie County up to $4,200,000 with a CARL match	
SUPPORTING ORGANIZATION(S): DEP, St. Lucie			
COUNTY(S): St. Lucie		***TOTAL:***	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** GL21 **Associated with:** GL18, GL19		***TOTAL:*** $10,800,000	
START: 1997	***END:*** 1999	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The Cypress Creek basin is part of a hydrological system that once stretched from the St. Johns River watershed through the Allapattah flats but is now separated into three different drainage basins. The Cypress Creek Restoration Project is in4ially an acquisition project. Once acquired, the flow through the cypress basin can be restored under SR 70 and its primary southern drainage can be restored by modifying Bluefield Road and the Bluefield canal. The site contains **a** large rookery, listed plants such as *Hansella filiformis* and *Pepperomia obtusifolia*, and at least four Native American archaeological sites.

RESTORATION BENEFITS: The Cypress Creek basin is a natural resource conservation and restoration project that has the potential to serve as the catalyst for a regional hydrological restoration/water preserve/water attenuation project. In the current water management regime. the Cypress Creek basin provides the headwaters for the St. Lucie River and will be a critical component of the Indian River Lagoon Restoration Project. The Cypress Creek Project will have consideration, greenways, and water attenuation benefits. Cypress Creek has been listed as a potential wildlife corridor in the Treasure Coast Regional Plan and DEP's Office of Greenways and Trafla is beginning a greenway planning process that will include the project area.

Time Line and Fiscal Year Budget (in thousands of dollars) for Cypress Creek Restoration Project																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Restoration																
Project																
																15,000
Subtotal																15,000

TITLE: Allapattah Flats			
SUBREGION : 2	***PROJECT ID:*** GL29	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	**SFWMD** $60,000,000	
PROJECT PLAN MANAGER: C. Rinaldi (561) 687-6537	***BASIS:*** 2	***TOTAL:*** $60,000,000	
LEAD ORGANIZATION(S): SFWMD		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): USACE			
COUNTY(S): Martin		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** GL19		**SFWMD** $60,000,000	
		TOTAL: $60,000,000	
START: 1997	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The Allapattah Flats SOR project covers 22,560 acres in western Martin County. The site is dominated by poorly drained flatwoods soils, which are saturated for much of the wet season. Historically, this area was a flatwoods matrix, interspersed with depression marshes and wet prairies. With the exception of the four northern sections that drain to Canal-23, the entire site drains slowly to the southeast to the South Fork of the St. Lucie River. Over the past 30 years, the project area has undergone a change in land use from native range grazing to improved pasture, sod farms, and row crops. Most of the understory has been cleared and planted in non-native pasture grasses. Most of the depression marshes remain; however, most of the wet prairies have been drained and the depression marshes have been significantly impacted by drainage. An area of hydric hammock dominates the extreme western boundary. There is good species diversity and many large trees remain.

RESTORATION BENEFITS: Restoration of Allapattah Flats will play a key role in the effort to reduce flows from C-23 into the St. Lucie Estuary. Regional attenuation facilities, or Water Preserve Areas, are proposed which would store stormwater runoff from the agricultural areas of western St. Lucie County. This would reduce damaging wet season discharges into the St. Lucie Estuary. After acquisition, about 8,000 acres of the project adjacent to C-23 would be converted to a reservoir to provide approximately 32,000 acre-feet of water storage. Estimates indicate that this would reduce wet season stormwater flows into the estuary by 39%. It is estimated that an additional 14% reduction in discharge to the estuary could be achieved by not draining the property. Completely eliminating stormwater discharges is not possible; however, significant reductions could probably be made by blocking existing drainage ditches.

The Florida Game and Fresh Water Fish Commission would be the lead manager for the non-reservoir areas. The District will take the lead on all hydrologic restoration efforts.

Time Line and Fiscal Year Budget (in thousands of dollars) for Allapattah Flats							
Task	1998	1999	2000	2001	2002	Unprog	Total
Land Acquisition	--	--	--	--	--	60.0	60.0
Project							
Subtotal							

TITLE: Bolles and Cross Canal Improvements			
SUBREGION : 2	***PROJECT ID:*** GL30	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** **Infrastructure Investment**	USACE: $1,100,000	
PROJECT PLAN MANAGER: K. Brooks-Hall 904-232-3155	***BASIS:*** 3	***TOTAL:*** $1,100,000	
LEAD ORGANIZATION(S): USACE		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): SFWMD			
COUNTY(S): Palm Beach		***TOTAL:*** $751,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on :** **Critical to : GL31** **Associated with: GL39**		***TOTAL:*** $349,000	
START: 1997	***END:*** 1999	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The Bolles and Cross Canals are east/west canals in the EAA constructed by the Everglades Drainage District prior to authorization of the C&SF Project. The C&SF Project design incorporated modifications to the original canal designs. However, construction was deferred. A General Reevaluation Report is being prepared to determine whether modifications are warranted based on existing conditions.

RESTORATION BENEFITS: The purpose of the project would be to provide improved flood control in the EAA in a manner such that the project also provides: improved water supply conveyance; greater capability for interbasin transfers that might enhance the treatment capacity of the STAs; and enhanced implementation of best management practices. The project could contribute toward maintaining a sustainable agriculture in the EAA that could be managed consistent with Everglades restoration goals.

From an environmental restoration perspective, the project could play an important role in maximizing the water quality treatment capacities of the STAs. Improvements to the Bolles and Cross Canals could enhance interbasin transfers of excess flood waters from an STA basin that is at its capacity to another that is operating at less than capacity. As a result, the effectiveness of the STAs could be enhanced. Studies to develop a recommended plan are scheduled to be completed in FY99. No construction is scheduled at this time.

Time Line and Fiscal Year Budget (in thousands of dollars) for Bolles and Cross Canal Improvements																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
USACE	304	293	56													349
Subtotal																**349**

TITLE: Everglades Program			
SUBREGION : 2,3,4	***PROJECT ID:*** GL31	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Land Acquisition, Infrastructure Investment, Science, Water Quality Protection	State: $710,900,000 Federal: (STA-1E): $127,025,000 (Includes construction, operations research, regulations, etc., but excludes Finance Charges)	
PROJECT PLAN MANAGER: Goforth (561)687-6280	***BASIS:***	***TOTAL:*** $837,925,000	
LEAD ORGANIZATION(S): SFWMD		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): USACE, FDEP			
COUNTY(S): Palm Beach, Hendry		***TOTAL:*** $214,148,000	
LINKED PROJECTS: **Dependent on:** GL35,SE03,TS23 **Critical to:** **Associated with:**		***REMAINING FINANCIAL REQUIREMENT:*** ***TOTAL:*** $623,777,000	
START: 1994	***END:*** 2014	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The Everglades Program, mandated by the 1994 Everglades Forever Act, is focused on restoring a significant portion of the remaining 1.5 million-acre central Everglades ecosystem through a program of construction, research, and regulation projects. The Everglades Program includes construction of six STAs covering approximately 47,250 acres in the EAA, with an effective treatment area of just over 42,000 acres. The sizes of the STAs were determined based on the projected effective treatment area required to achieve a long-term average annual phosphorus discharge of approximately 50 parts per billion. The locations were selected on the basis of their proximity to the primary canals within the EAA and the Everglades Protection Area. The program also includes construction projects to restore natural hydropatterns to WCA-2A, WCA-3A and the Rotenberger Wildlife Management Area. The Everglades Program is comprised of 55 interrelated projects which make up 7 program elements: Everglades Construction Projects (18 projects including operation and maintenance), Hydropattern Restoration (7 projects), Research and Monitoring (12 projects), Regulation (10 projects), Exotic Species Control (2 projects), Funding (5 projects), and Annual Progress Report (1 project). While achieving interim, or Phase I, goals, many of the projects also focus on evaluating Phase II, or long-term, restoration goals. Of particular note are the research activities designed to determine the ultimate phosphorus standard and to evaluate supplemental water quality treatment technologies designed to achieve the long-term phosphorus discharge limit.

RESTORATION BENEFITS: The overall purposes of the Everglades Program are to: (1) reduce the loads of phosphorus entering the Everglades Protection Area; (2) increase the quantity of water delivered to the Everglades Protection Area by approximately 28 percent over the 1979-1988 baseline period; (3) capture, store, and clean up approximately 350,000 acre feet per year of excess stormwater currently lost to tide; (4) improve the timing and distribution of freshwater flows to the Everglades Protection Area; (5) reduce harmful discharges of freshwater to the St. Lucie and Caloosahatchee estuaries; (6) provide a buffer between the EAA and the Everglades; and (7) protect wetlands and habitat values outside the Everglades, notably in the Holey Land and Rotenberger areas.

Time Line and Fiscal Year Budget (in thousands of dollars) for the Everglades Program

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
ECP Design																
ECP Land																
ECP Construction																
ECP Operation																
Research & Monitoring																
Exotic Species Control																
Regulation																
O & M																
Project																
SFWMD	54783	116896	11775	29649	17249	62710	77729	49754	14050	9467	9799	10142	10497	10864	47394	638,458
USACE (DOI)	0	46600	2241	3742	38614	35828										127,025
Subtotal																$765,483

TITLE: EAA Lands/Water Management Area(s) - Land from Willing Sellers for Water Storage, Detention and Water Quality Treatment			
SUBREGION : 2	***PROJECT ID:*** GL33	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	Federal $100,000,000	
PROJECT PLAN MANAGER: Rinaldi (561)687-6537	***BASIS:*** 2	***TOTAL:*** $100,000,000	
		APPROPRIATED TO DATE:	
LEAD ORGANIZATION(S): SFWMD , DOI		State: $0	
SUPPORTING ORGANIZATION(S): None		Federal: $3,100,000	
COUNTY(S): Palm Beach		***TOTAL:*** $3,100,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:**		Federal $96,900,000	
Critical to:			
Associated with: TS01		***TOTAL:*** $96,900,000	
START: 1997	***END:*** 1999	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project will focus on acquisition of approximately 50,000 to 90,000 acres of land in the EAA that can be purchased at fair market value from willing sellers. Acquisition may be accomplished by outright purchase of 50,000 to 90,000 acres from willing sellers, or through a combination of purchases and land trades. After its purchase, this land could be leased to agriculture pending completion of the C&SF Project Comprehensive Review Study.

RESTORATION BENEFITS: The purpose of this project is to acquire strategically located lands in the EAA that can be used for regional water storage, detention, and water quality treatment facilities. Initially, this land could be placed in public ownership and leased back for agricultural operations. Presently, there is no technical consensus on the precise amount and location of EAA land required for ecosystem restoration. The precise amount and location of lands ultimately required for water storage, detention, and water quality treatment will be determined through the C&SF Project Comprehensive Review Study. If this study determines that not all of this land is necessary for ecosystem restoration or protection efforts, then excess land could be sold and these dollars could be used to fund other restoration projects. Leaseback of lands to agriculture would produce a revenue stream to stretch land acquisition/ecosystem restoration funds and would help to maintain agricultural economic viability in the EAA. Ecosystem restoration benefits include: regional water storage that would reduce water currently lost to tide and make it available for hydropattern restoration in the Everglades; pollution prevention through reduction of phosphorus loads; reduced loading of nutrients and other pollutants through implementation of water quality treatment facilities; reduced subsidence; and avoidance of adverse flooding of WCAs and tribal lands during wet years.

Time Line and Fiscal Year Budget (in thousands of dollars) for EAA Lands/Water Management Area(s) - Land from Willing Sellers for Water Storage, Detention and Water Quality Treatment

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Land Acq			[redacted]													
Project																
Federal			96,900													96,900
Subtotal																**96,900**

TITLE: Rotenberger/Holey Land Wildlife Management Areas			
SUBREGION : 2	***PROJECT ID:*** GL34	***FINANCIAL REQUIREMENT:*** (proposed)	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	State	
PROJECT PLAN MANAGER: Robert Hicks (850) 488-2351	***BASIS:*** 1, and 3	***TOTAL:*** $16,200,662 (estimated)	
LEAD ORGANIZATION(S): FDEP		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): SFWMD, FGFWFC			
COUNTY(S): Palm Beach		***TOTAL:*** $11,650,838	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** EFA implementation **Associated with:** GL35		***TOTAL:*** $4,,549,824	
START: 1984	***END:*** Completion of acquisition	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This land consists of 3,717 acres of disturbed sawgrass marsh. It is adjacent to and south of the Talisman tract and acts as a buffer between the heavily disturbed agricultural area and the more natural Everglades system. The land is a designated Wildlife Management Area and managed by the Florida Game and Fresh Water Fish Commission.

RESTORATION BENEFITS: Public acquisition will be instrumental in restoring a more traditional, ecologically healthy flow and distribution of water into the Everglades ecosystem. The land is needed for the operation of STA 5.

Time Line and Fiscal Year Budget (in thousands of dollars)																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Land Acquisition																
Project																
State DEP																4,549
Subtotal																**4,549**

TITLE: Stormwater Treatment Areas 1-West and 2 through 6 and C-51W			
SUBREGION : 2, 5	***PROJECT ID:*** GL35	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	**SFWMD:** $118,148,534	
PROJECT PLAN MANAGER: Rinaldi (561) 687-6537	***BASIS:*** 2	*TOTAL:* $118,148,534	
LEAD ORGANIZATION(S): SFWMD		***APPROPRIATED TO DATE:*** **SFWMD:** $87,963,859	
SUPPORTING ORGANIZATION(S): None			
COUNTY(S): Palm Beach		***TOTAL:*** $87,963,859	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on :** **Critical to:** GL31 **Associated with:**		**SFWMD:** $30,184,675 ***TOTAL:*** $30,184,675	
START: 1994	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project involves acquisition of approximately 45,000 acres within the EAA in western and central Palm Beach County. The locations and footprints for the STAs were originally developed in the mediated technical plan for Everglades restoration in 1993 by the USACE, SFWMD, DOI, and other stakeholder, and have been modified slightly during the design effort. The sizes of the STAs are determined based on the projected effective treatment area required to achieve a long-term average annual phosphorus discharge of approximately 50 parts per billion. The locations were selected on the basis of their proximity to the primary canals within the EAA and the Everglades Protection Area.

RESTORATION BENEFITS: These lands are needed to implement the restoration plan identified in the proposed modifications to the 1992 Federal Consent Decree and the 1994 Everglades Forever Act. The overall purposes of the project are to: (1) reduce the loads of phosphorus entering the Everglades Protection Area; (2) increase the quantity of water delivered to the Everglades Protection Area by approximately 28 percent over the 1979-1988 baseline period; (3) capture, store, and clean up approximately 350,000 acre feet per year of excess stormwater currently lost to tide; (4) reduce harmful discharges of freshwater to the St. Lucie and Caloosahatchee estuaries; (5) provide a buffer between the EAA and the Everglades; and (6) protect and conserve wetlands and habitat values outside the Everglades, notably in the Holey Land and Rotenberger areas.

Time Line and Fiscal Year Budget (in thousands of dollars) for Stormwater Treatment Areas 1 West and 2 through 6 and C-51W

Task	1998	1999	2000	2001	2002	Unprog	Total
Land Acquisition Info Below							
C-51W	9,652,253	--	--	--	--	--	9,652,253
STA-1W	5,643,495	3,675	--	--	--	--	5,647,170
STA-2	4,373,129	3,675	--	--	--	--	4,376,804
STA-3 & 4	605,761	24,693,430	24,300	10,410	--	--	25,333,901
STA-5	1,033,741	3,675	--	--	--	--	1,037,416
STA-6	303,500	3,675	5,441,835	--	--	--	5,749,010
Land Acquisition	21.6	24.7	5.5	--	--	--	51.8
Project							
Subtotal							

TITLE: Technical Assistance to EAA and C-139 Basin			
SUBREGION S: 2,3,5	***PROJECT ID:*** GL36	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Natural Resources Management	USDA $17,498,000	
PROJECT PLAN MANAGER: William Boyd (561) 795-5451	***BASIS:*** 2	***TOTAL:*** $17,498,000	
LEAD ORGANIZATION(S): NRCS		***APPROPRIATED TO DATE:*** USDA $3,000,000	
SUPPORTING ORGANIZATION(S): IFAS/ES, ARS, ERS		***TOTAL:*** $3,000,000	
COUNTY(S): Palm Beach, Hendry		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		USDA $14,498,000 ***TOTAL:*** $14,498,000 (6,498,000 unfunded)	
START: 1995	***END:*** 2005	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Provide technical assistance to growers that voluntarily address resource needs on private land in the EAA and C-139 Basin. The project involves one on one assistance to plan, design, install, and manage BMPs to reduce phosphorus loading in the Everglades Protection Area and to reduce soil depletion (subsidence). These conservation practices address water quality/quantity, soil quality, point and non point source pollution, agricultural runoff, erosion prevention, crop management, wildlife habitat improvement, agricultural production, and other issues.

RESTORATION BENEFITS: The project will promote and support the conservation of natural resources on private land in a way that will enable private landowners to voluntarily participate in the restoration of the south Florida ecosystem. The project will significantly reduce offsite transport of pesticides, fertilizers, and soil particles, conserve water, reduce soil depletion, sustain agricultural production and enhance wildlife habitat.

Time Line and Fiscal Year Budget (in thousands of dollars) for Technical Assistance to EAA and C-139 Basin

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
NRCS (funded)	1000	1000	1000	1000	1000	1000	1000	1000	1000							11,000
NRCS (unfunded)	200	200	200	200	200	200	200	200	200							1,800
IFAS (unfunded)	500	500	500	500	500	500	500	500	500							4,500
ARS (unfunded)	20	20	20	20	20	20	20	20	20							180
ERS (unfunded)	2	2	2	2	2	2	2	2	2							18
Subtotal																**17,498**

TITLE: Monitoring of Organic Soils in the Everglades			
SUBREGION: 2, 3	***PROJECT ID:*** GL37	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Natural Resources Management	NRCS $1,500,000 ARS $25,000 IFAS $11,403	
PROJECT PLAN MANAGER: Greg Hendricks 561-795-5451	***BASIS:*** Task Force Priority 1	***TOTAL:*** $1,536,403	
LEAD ORGANIZATION(S): NRCS		***APPROPRIATED TO DATE:*** ARS $25,000 IFAS $11,403	
SUPPORTING ORGANIZATION(S): ARS, I FAS		***TOTAL:*** $36,403	
COUNTY(S): Palm Beach, Broward, Dade, Monroe		***REMAINING FINANCIAL REQUIREMENT:*** NRCS $1,500,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** CE05 **Associated with:** GL38, GL39		***TOTAL:*** $1,500,000	
START: 1997	***END:*** 2011	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project proposes to monitor the accretion or subsidence of organic soils throughout the Everglades. ARS and IFAS have allocated funding to continue monitoring soils in the Everglades Agricultural Area (EAA) that had been monitored at approximately 5-year intervals from 1913 to 1978. It is hoped that this activity will provide training to NRCS staff to expand this monitoring throughout the Everglades if this long-term project is funded.

RESTORATION BENEFITS: A major goal is to restore the natural hydrology throughout the Everglades. Under natural conditions, the organic soils of the Everglades accreted very slowly. Under managed conditions, soils of the EAA have subsided rapidly, and some soils in the Water Conservation Areas have accreted more rapidly than under natural conditions while others have subsided. By monitoring organic soils as proposed in this project, scientists will be able to determine at both macro and micro levels the effects of projects aimed to restore natural hydrological conditions

Time Line and Fiscal Year Budget (in thousands of dollars) for Monitoring of Organic Soils in the Everglades

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
NRCS																
Project																
NRCS	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	1,500
Subtotal																**1,500**

TITLE: Soil Survey Update for the Everglades Agricultural Area			
SUBREGION : 2	***PROJECT ID:*** GL38	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Natural Resources Management	NRCS $1,500,000	
PROJECT PLAN MANAGER: Greg Hendricks (561) 795-5451	***BASIS:*** 3	***TOTAL:*** $1,500,000 (unfunded)	
LEAD ORGANIZATION(S): NRCS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): USGS, IFAS			
COUNTY(S): Palm Beach		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:**		NRCS $1,500,000	
Critical to: GL31, GL36, GL37, TS5			
Associated with: TS4		***TOTAL:*** $1,500,000 (unfunded)	
START: 1997	***END:*** 2000	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project will produce a new comprehensive soil survey of the Everglades Agricultural Area (EAA) that consists of approximately 700,000 acres. This soil survey will consist a of spatial representation of soil map units and series across the EAA landscape. A detailed soil series description will be developed that describes the soil profile, sequence of layers from the surface to rock, and other important physical, biological and ecological features.

RESTORATION BENEFITS: The current county level soil survey (Palm Beach) which includes the EAA is almost 20 years old, published in 1978. Significant changes have occurred over this period due to organic soil subsidence, as well as water and land management objectives currently being applied in the EAA. Benefits associated with a new comprehensive soil survey include better on-farm land and water management decision making by agricultural growers that would assist in south Florida ecosystem restoration efforts. Other benefits included from a new soil survey would be major soil characterization data gaps that currently exist in the present soil survey, as well as a key information that will be required for new hydrologic and ecologic models being developed.

Time Line and Fiscal Year Budget (in thousands of dollars) for Wetland Determinations																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
NRCS unfunded	250	500	500	250												1,500
Subtotal																**1,500**

TITLE: Sustainable Agriculture in the Everglades Agricultural Area			
SUBREGION : 2	***PROJECT ID:*** GL39	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research	ARS $20,000,000	
PROJECT PLAN MANAGER: Miller (561) 924-5227	***BASIS:*** 1	***TOTAL:*** $20,000,000	
LEAD ORGANIZATION(S): ARS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): IFAS, FL Sugarcane League			
COUNTY(S): Palm Beach, Hendry		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** GL40		ARS $20,000,000	
Critical to:			
Associated with: TS01		***TOTAL:*** $20,000,000	
START: 1998	***END:*** 2018	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: ARS already has a world renowned sugarcane genetics program at Canal Point, FL. An annual increase of $1 million would equip this program to include new genetic, agronomic, physiologic, and hydrologic research to improve sugarcane's water tolerance and ability to reduce phosphorus runoff. This research aims to enable growers to gradually manage their water to better approximate the natural hydrology of the EAA while maintaining current profit levels.

RESTORATION BENEFITS: Benefits would occur simultaneously to EAA agriculture, regions of the natural Everglades linked hydrologically to the EAA, and to urban areas who would benefit from increased water storage in the EAA. The proposed research would allow EAA farmers to conserve their soils and thereby sustain their agriculture. Since conserving the soils would require restoring conditions similar hydrologically to natural conditions, and potentially increase water storage, the soil conservation would concurrently serve as a guide to restoring proper hydrologic links to the EAA with its linked regions. The genetics work on phosphorus utilization by sugarcane and the restoration of natural hydrological conditions would both help improve the ability of agriculture in the EAA to filter phosphorus from incoming water and to remove phosphorus from the Everglades.

Time Line and Fiscal Year Budget (in thousands of dollars) for Sustainable Agriculture in the Everglades Agricultural Area

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
ARS		1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	7000	20,000
Subtotal																

TITLE: Development of Diverse Sugarcane Germplasm and its Use in Development of Improved Varieties			
SUBREGION : : 2	***PROJECT ID:*** GL40	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research	ARS $20,000,000 FSCL $8,000,000 IFAS $1,250,000 ***TOTAL:*** $21,250,000	
PROJECT PLAN MANAGER: Miller (561) 924-5227	***BASIS:*** **3**	***APPROPRIATED TO DATE:***	
LEAD ORGANIZATION(S): ARS		ARS $4,400,000 FSCL $2,400,000 IFAS $550,000 ***TOTAL:*** $6,550,000	
SUPPORTING ORGANIZATION(S): FSCL, IFAS			
COUNTY(S):		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to:** GL30 **Associated with:**		ARS $15, 600,000 FSCL $5,600,000 IFAS $700,000 ***TOTAL:*** $14,700,000	
START: 1990	***END:*** 2010	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The objective of the sugarcane genetics program is to develop varieties for the Everglades Agricultural Area (EAA) which produces about 10 percent of the sugar consumed in the United States. ARS, IFAS, and two companies who represent more than half of the Florida sugarcane production have initiated research to select and develop sugarcane adapted to higher water tables and sugarcane that will improve the ability of sugarcane to filter and remove phosphorus from the ecosystem. Both of these efforts have been initiated with end of year funding that has totaled about $270,000 over two years. Both efforts are very preliminary and need further funding if objectives are to be met.

RESTORATION BENEFITS: Restoration benefits from this project will come primarily from this project's link to the project titled Sustainable Agriculture in the Everglades Agricultural Area. Without this project as a foundation, the linked sustainable agriculture project will not be possible. Also, without this project as a foundation, future efforts to genetically modify sugarcane for ecological benefit in south Florida would not be possible.

Time Line and Fiscal Year Budget (in thousands of dollars) for Development of Diverse Sugarcane Germplasm and its Use in Development of Improved Varieties

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
ARS																
FSCL																
IFAS																
Project																
Program	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	6550	21,250
Subtotal																

TITLE: Lake Okeechobee Demonstration ASR Project			
SUBREGION : 2	***PROJECT ID:*** GL41	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Infrastructure Investment	USACE: SFWMD:	
PROJECT PLAN MANAGER: Devillon, (561) 687-6383	***BASIS:*** 2	***TOTAL:*** $5,500,000	
LEAD ORGANIZATION(S): Suggested SFWMD, USACE		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): FDEP			
COUNTY(S): Palm Beach		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: Dependent on: **Critical to:** TS01 **Associated with:**		USACE: SFWMD: ***TOTAL:*** $5,500,000	
START: 2000	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project will implement a regional Aquifer Storage and Recovery (ASR) demonstration project at Lake Okeechobee to increase storage in the regional system. This increased storage by itself will provide additional water to meet local agricultural demands in the EAA. Historically, water is brought into the EAA from Lake Okeechobee to supply local agricultural interests. It is the intent of this demonstration project to evaluate the feasibility of storing Class 1 surface water within the basin for use during times of need. Full scale implementation of this option is not proposed at this time. The demonstration project would consist of four 5 MGD Floridan Aquifer System wells and one 20 MGD surface water pump to withdraw from Lake Okeechobee. Water will be withdrawn from Lake Okeechobee and injected into the Floridan Aquifer System for later retrieval. It is anticipated that extensive discussions with EPA and DEP will be required for permitting injection of Class 1 surface water into the Floridan Aquifer System.

RESTORATION BENEFITS: By creating additional storage in the region, less water will be required from the regional system to meet demands of the agricultural areas. Full scale implementation of this project may also help reduce excessive regulatory discharges to the coastal estuaries. Projected demands for the EAA approach 400,000 AF/yr on average. Full scale implementation of this option should store a significant volume of water for later use by the agricultural operations thereby freeing up a substantial amount of water for Everglades restoration. Anticipated volumes that can be potentially stored in the EAA will be determined once the results of the demonstration project have been fully evaluated.

No funds have been made available for this project.

Time Line and Fiscal Year Budget (in thousands of dollars) for Lake Okeechobee ASR Pilot Project

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Permitting				■												
Construction				■	■											
Testing					■	■										
Project																
USACE																
SFWMD																
Subtotal																$5,500

TITLE: Cayo Costa Island			
SUBREGION : 2	***PROJECT ID:*** GL47	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	State: 100 percent	
PROJECT PLAN MANAGER: Ilene Barnett (941) 332-6975	***BASIS:*** 1, and 3	***TOTAL:*** $24,445,539 (estimated)	
LEAD ORGANIZATION(S): FDEP		***APPROPRIATED TO DATE:*** State:	
SUPPORTING ORGANIZATION(S): USFWS			
COUNTY(S): Lee		***TOTAL:*** $20,760,877	
		REMAINING FINANCIAL REQUIREMENT: State:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $3,684,662	
START: 1980	***END:*** Completion of acquisition	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The project area, involving 1,932 acres, includes Cayo Costa and North Captiva, both part of a small chain of barrier islands that provide protection for Charlotte Harbor, one of Florida's most productive estuaries. The natural communities within the project are in excellent condition and have high species diversity; some may be unique to these islands. This project contains several archaeological and historical sites. Cayo Costa Island is subdivided into small lots and is threatened by rapid residential development.

RESTORATION BENEFITS: The project will protect the beaches, dunes, and hammocks of these islands. The maintenance of these islands is a natural state will provide protection for the bay, including relief from storm events, and minimize further water quality impacts from development.

TITLE: Charlotte Harbor Flatwoods			
SUBREGION : 2	***PROJECT ID:*** GL48	***FINANCIAL REQUIREMENT:*** (proposed)	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	State: 50 percent Federal: 50 percent	
PROJECT PLAN MANAGER: Ilene Barnett (941) 332-6975	***BASIS:*** 1, and 3	***TOTAL:*** $35,037,868 (estimated)	
LEAD ORGANIZATION(S): FDEP		***APPROPRIATED TO DATE:*** State: $10,244,440 Federal:	
SUPPORTING ORGANIZATION(S): USFWS, FGFWFC			
COUNTY(S): Charlotte and Lee		***TOTAL:*** $10,244,440	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $24,793,828	
START: 1992	***END:*** Completion of acquisition	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The project area, located northwest of Fort Myers in Charlotte and Lee Counties, includes 18,708 acres containing the largest and highest quality slash-pine flatwoods left in Southwest Florida. The area contains pockets of old growth that provide habitat for red-cockaded woodpeckers, black bears, and bald eagles, and an occasional Florida panther ranges in the area. Additionally, the tract provides habitat for rare plant communities. Several drainages flow through these flatwoods into the Charlotte Harbor Aquatic Preserve.

RESTORATION BENEFITS: Acquisition will provide buffer and management area for wildlife, and habitat for many endangered species, those particularly vulnerable to development. It also will help protect the flatwoods and connect the Charlotte Harbor State Reserve with the Cecil M. Webb Wildlife Management Area, helping to protect both of these managed areas and the waters of the Aquatic Preserve.

The project will be designated as a wildlife management area, with such uses as hiking, environmental education and hunting. The area would be managed by Florida Game and Fresh Water Fish Commission.

TITLE: Ding Darling National Wildlife Refuge Complex			
SUBREGION : 10	***PROJECT ID:*** GL49	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition		
PROJECT PLAN MANAGER: Johnson/Hinds (407) 562-3909	***BASIS:***	***TOTAL:*** $6,027,500	
LEAD ORGANIZATION(S): USFWS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): SCCF, Lee County, TNC			
COUNTY(S):		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $6,027,500	
START: 1997	***END:*** Until Complete	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project involves adding 301 acres to various units that are managed by J.N. “Ding” Darling National Wildlife Refuge and also includes acquisition of parcels for Matlacha Pass, Caloosahatchee, Pine Island Sound, and Island Bay National Wildlife Refuges which are in the Charlotte Harbor region.

RESTORATION BENEFITS: The Charlotte Harbor estuary has undergone dramatic ecological changes as a result of the large volumes of fresh water that have been sent to tide through the Caloosahatchee River from Lake Okeechobee. The seagrass beds, mangrove forests, and oyster beds in the estuary have declined significantly as a result of this water delivery. This project would protect critical elements of the remaining mangroves and transitional wetlands in the Charlotte Harbor estuary.

TITLE: WCA-3A West Hydropattern Restoration			
SUBREGION : 2	***PROJECT ID:*** GL52	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Infra Invest	(funding is included in the budget for the Everglades Program) USACE, SFWMD	
PROJECT PLAN MANAGER: Hornung, 561-687-6616	***BASIS:*** 2	***TOTAL:*** $1,700,000	
LEAD ORGANIZATION(S): USACE		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): SFWMD			
COUNTY(S): Palm Beach		***TOTAL:*** 0	
LINKED PROJECTS: **Dependent on :** **Critical to :** GL31 **Associated with:** GL30		***REMAINING FINANCIAL REQUIREMENT:*** ***TOTAL:*** $1,700,000	
START: 2000	***END:*** 2003	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Compartmentalization of the Everglades has disrupted the hydrological and ecological patterns and relation. The hydropattern restoration project for WCA-3A West consists of reestablishing sheetflow along the northern perimeter of WCA-3A between the Miami Canal and levee L-28. The proposed project consists of degrading south levee L-4, breaching the existing north levee L-4, and adding control gates to an existing culvert. Treated discharges from STA- 5 and 6 will be used to restore the hydropattern in WCA-3A West.

RESTORATION BENEFITS: By restoring more natural hydropatterns and sheetflow, habitat quality is expected to increase for many of the species which are supported in the Everglades environment. Those species include the snail kite, wood stork, white ibis, white-tailed deer, Florida panther, and the American alligator. Maintenance of hydropattern are critical in maintaining the ecology necessary to restore and maintain high quality food sources for foraging wildlife. More importantly, the project will result in conditions similar to the original, undisturbed Everglades habitat.

Time Line and Fiscal Year Budget (in thousands of dollars) for WCA-3A West Hydropattern Restoration																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
USACE				75	200	500	500									1,275
SFWMD					75	175	175									425
Subtotal																**1,700**

TITLE: Seminole Tribe Best Management Practices for the Brighton Reservation			
SUBREGION : 2	***PROJECT ID:*** GL53	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Natural Res. Mgt., Water Quality	NPS $80,000 Seminole Tribe $338,000	
PROJECT PLAN MANAGER: Tepper (954)966-6300X1120	***BASIS: Ecosystem Restoration***	***TOTAL:*** $418,000	
LEAD ORGANIZATION(S): Seminole Tribe of Florida (STOF)		***APPROPRIATED TO DATE:*** NPS $80,000	
SUPPORTING ORGANIZATION(S): NRCS, ARS, IFAS/ES			
COUNTY(S): Glades		***TOTAL:*** $80,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** TS08, SW03, SW18, SW19, GL53, GL54,		***REMAINING FINANCIAL REQUIREMENT:*** ***TOTAL:*** $338,000	
START: 1/1998	***END:*** 2004	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The Seminole Tribe will contract with NRCS to implement a comprehensive system of best management practices (BMP's) for the Brighton Reservation. Enhanced water management will be accomplished through application of field-level BMP's which might include: conservation irrigation systems; nutrient loading reduction; application procedure training; cross-fencing for grazing management; livestock watering facilities; grazing management plans; closed-end irrigation systems; and a tail-water recovery system, where appropriate.

RESTORATION BENEFITS: Implementation of the BMP's would provide immediate water quality benefits for the watershed which includes Lake Okeechobee. They would also compliment a comprehensive system of surface water management works planned for the Brighton Reservation.

Time Line and Fiscal Year Budget (in thousands of dollars) for Seminole Tribe Best Management Practices for the Brighton Reservation

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Design		■	■													
Permitting			■													
Construction				■	■	■	■	■								
Project																
NPS		80														
Seminole Tribe			80	20	65	155	31	27	40							418
Subtotal																**418**

TITLE: Seminole Tribe Comprehensive Surface Water Management System for the Brighton Reservation			
SUBREGION : 2	***PROJECT ID:*** GL54	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Infrastructure Investment		
PROJECT PLAN MANAGER: Tepper (954)966-6300X1120	***BASIS:*** 1	***TOTAL:*** $15,818,000	
		APPROPRIATED TO DATE:	
LEAD ORGANIZATION(S): Seminole Tribe of Florida (STOF)		NPS $150,000	
SUPPORTING ORGANIZATION(S): NRCS, COE, SFWMD, EPA			
COUNTY(S): Glades		***TOTAL:*** $150,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** SW17, SW18, SW19, GL06		***REMAINING FINANCIAL REQUIREMENT:*** ***TOTAL:*** $15,668,000	
START: 1/1998	***END:*** 2010	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: A comprehensive surface water management system is to be designed and implemented for the Brighton Reservation which will include irrigation storage, flood control, surface water conveyance and water quality treatment. This Reservation is dependent upon surface water as its primary source of fresh water. The water is lifted from C&SF Canals and Lake Okeechobee into five sub-basins. These waters, upon distribution to agricultural land uses, are discharged to borrow canals leading directly to Lake Okeechobee.

RESTORATION BENEFITS: This plan would provide positive water management benefits to the Indian Prairie Basin which discharges into Lake Okeechobee.

- Water quality will be improved by reducing nutrient loadings through detaining discharges from Tribal lands in each sub-basin.
- Flood control will be enhanced through the implementation of additional sites in each sub-basin.
- Storage and conveyance of surface waters will be increased and enhanced in each and between sub-basins.
- Rehydration of sweet cabbage palm flatwood slough systems in each sub-basin will also be accomplished.

Time Line and Fiscal Year Budget (in thousands of dollars) for Seminole Tribe Comprehensive Surface Water Management System for the Brighton Reservation

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Design																
Permitting																
Construction																
Operation & Maintenance																
Project																
NPS		150														150
Seminole Tribe			20	8687	1940	1358	1358	1705	100	100	100	100	100	100		15,818
Subtotal																**15.818**

TITLE: Palm Beach County Water Utilities Reclamation Project			
SUBREGION : 2	***PROJECT ID:*** GL55	***FINANCIAL REQUIREMENT:*** Land - $3.0 million Engineering/Permitting/Construction - $13.0 million ***TOTAL:*** $16.0 million	
PROGRAM CATEGORY: Land & Infrastructure	***BUDGET CATEGORY:***		
PROJECT PLAN MANAGER: G Demian, 561-641-3429	***BASIS:***	***APPROPRIATED TO DATE:*** (Since 1992) Palm Beach County Water Utilities Dept. Approved Capital Improvements Budget ***TOTAL:*** $11.0 million	
LEAD ORGANIZATION(S): Palm Beach County			
SUPPORTING ORGANIZATION(S): SFWMD, FDEP, PBCERM			
COUNTY(S): Palm Beach		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to:** Local wetlands restoration, ground water recharge, water reclamation and linkage to Greenways **Associated with:** PBCWUD's Existing 50-acre Wakodahatchee Wetland		***TOTAL:*** $5.0 million	
START: 10/97	***END:*** 12/01	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Palm Beach County Water Utilities Department (PBCUWD) is proceeding with an aggressive water reclamation program water reclamation program which include golf course and residential irrigation and constructed wetlands. Over 40 acres of wetlands (named the Wakodahatchee Wetland) were constructed to treat and reclaim as much as 3 million gallons per day (mgd) of water from the County's Southern Region Water Reclamation Facility (SRWRF) located in southwestern Palm Beach County. The ultimate goal is to utilize the wetlands for additional treatment of the secondarily treated wastewater and to recharge the local ground water and canal systems. In addition, the wetland provides an aesthetic benefit and improves the quality of life to the local community.

Directly between the Wakodahatchee and the SRWRF is an approximately 290 acre parcel of land used primarily for pepper farming. PBCWUD has recently signed a contract with the owner to purchase 175 acres for purposes of constructing additional wetlands. These wetlands will be constructed similar to the Wakodahatchee including shallow marshes, deep zones, uplands, and habitat islands, all planted with native vegetation. Also similar to the Wakodahatchee, a boardwalk and nature trail will be constructed to provide limited public access for the purpose of educating the local community on the importance of reclaiming water and providing a habitat for wildlife including several species of wading birds. This new wetland will be linked with the Wakodahatchee to allow public access to both facilities, and increase the greenspace within the fast developing area of the County.

RESTORATION BENEFITS: Restoration benefits include:

- Reclamation of 10 mgd of water which would normally be disposed of in deep injection wells
- Recharging the local ground water which directly benefits the County's surficial aquifer wellfields
- Recharging the area canal network, thereby reducing reliance on the regional water supply system
- Creating additional habitat for local wildlife which include threatened and endangered species
- Increasing the amount of "greenspace" in the area, which helps to reduce the impact of over-drainage caused by encroaching development. This benefit aligns with the benefits associated with the proposed Water Preserve Areas located less than two miles west of this site.
- Providing a linkage with the "Greenways" concept in southeast Florida.

Collectively, these restoration benefits meet the applicability criteria for critical restoration projects.

Time Line and Fiscal Year Budget (in thousands of dollars) for Palm Beach County Water Utilities Reclamation Project

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Land Purchase	1000	1000	1000													
Design/Permit			1500	1500												3000
Project																
	1000	1000	2500	6500	5000											16000
Subtotal																

TITLE: Floridan Aquifer Restoration			
SUBREGION : 2	***PROJECT ID:*** GL56	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Water Quality	USACE: $500,000 SFWMD: $500,000 USDA NRCS: $200,000	
PROJECT PLAN MANAGER: Donna Smith 561-461-4546	***BASIS:*** 2	***TOTAL:*** $1,200,000	
LEAD ORGANIZATION(S): USDA NRCS		***APPROPRIATED TO DATE:*** **USDA_NRCS $50,000** **SFWMD $50,000**	
SUPPORTING ORGANIZATION(S): SFWMD		***TOTAL:*** $100,000	
COUNTY(S): St. Lucie		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to: UEC-21M** **Associated with:** ***UEC-12M***		***TOTAL:*** $1,100,000	
START: 1998	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: To restore the Florida aquifer in St. Lucie County by plugging Floridan aquifer wells, gathering data for regional ground water models, and by installing on-site water control structures on agricultural land. Each well will be logged before it is plugged. In addition, other wells on the property will be metered as part of the on-going SWIM study being carried out by SFWMD and St. Lucie Soil & Water Conservation District.

RESTORATION BENEFITS: By permanently plugging unused Floridan aquifer wells there will be less chance of contamination from other aquifers where damaged casing exists. In addition, it will eliminated the risk of future use or free-flow. Regional modeling efforts will allow for more informed permitting decisions.

Time Line and Fiscal Year Budget (in thousands of dollars) for Floridan Aquifer Restoration

Task	98	99	00	01	02	03	04	05	06	07	08	09	10	11	Unprog	Total
ID Participants	■															
Write Individual Plans of Action	■	■														
Collect Data for GW Models	■	■	■	■	■											
Perform Cons. Measures	■	■	■	■	■											
Project																
Subtotal																**$1,100**

TITLE: Urban Mobile Irrigation Lab			
SUBREGION : 2	***PROJECT ID:*** GL57	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Water Quality	USACE: $250,000 IRLNEP/SJRWMD: $250,000 USDA NRCS: $1,008,000	
PROJECT PLAN MANAGER: Donna Smith 561 461-4546	***BASIS:*** 2	***TOTAL:*** $1,508,000	
LEAD ORGANIZATION(S): USDA NRCS		***APPROPRIATED TO DATE:*** (Since 1992) USDA NRCS: $180,000	
SUPPORTING ORGANIZATION(S): IRLNEP/ SJWMD			
COUNTY(S): Okeechobee, St Lucie, Martin		***TOTAL:*** $1,688,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** **UEC-13M** **Associated with:** ***UEC-12M,***		***REMAINING FINANCIAL REQUIREMENT:*** ***TOTAL:*** $1,508,000	
START: 1997	***END:*** 2011	***APPROVED:***	***LAST REVISION:*** 10/97

DESCRIPTION: To add an urban MIL component to the two existing MIL's in the IRL basin in order to reduce water used and subsequent runoff in urban areas. Public information as well as system efficiency checks will be emphasized. Public buildings, golf courses, condominiums and private home systems will be included. Public workshops will be held at homeowners meetings, environmental fairs, and as part of the Florida Yards and Neighborhoods program promoting urban BMP's. Other public information activities will include mailouts and a rain-shutoff device program.

RESTORATION BENEFITS: Reduce fresh water attenuation to the IRL. Since the agricultural MIL's were setup in 1992, approximately 450 evaluations have been performed on 15,000 acres of agricultural land with and estimated potential water savings of 940 million gallons.

Time Line and Fiscal Year Budget (in thousands of dollars) for Urban Mobile Irrigation Lab

Task	98	99	00	01	02	03	04	05	06	07	08	09	10	11	Unprog	Total
Staff And Equip 2 Urban Mil's	■															
Perform Urban Evaluations- & Public Info	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
Project																
Subtotal																**1,508**

TITLE: Caloosahatchee River			
SUBREGION : 2	***PROJECT ID:*** GL58	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: M/I/S	***BUDGET CATEGORY:*** Area Management	**SFWMD** $104,250,000 **USACE** $100,100,000 ***TOTAL:*** $204,350,000	
PROJECT PLAN MANAGER: Dawdy (941) 338-2929	***BASIS:*** 1,2,3	***APPROPRIATED TO DATE:***	
LEAD ORGANIZATION(S): SFWMD			
SUPPORTING ORGANIZATION (S): CRCA, USACE. IFAS, CHNEP			
COUNTY(S): Lee, Hendry, Glades, Charlotte		***TOTAL:*** $500,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** Caloosahatchee Estuary, USACE Restudy **Associated with:** Charlotte Harbor NEP		***TOTAL:*** $203,850,000	
START: 1997	***END:*** 2005	***APPROVED:***	***LAST REVISION:*** 9/97

DESCRIPTION: The C-43 canal project was originally intended to provide a minimum 8-foot navigable waterway between Lake Okeechobee to the Gulf of Mexico, remove runoff from the project area during a storm equal to 30% of the standard project flood, reduce the depth and duration of floods of greater magnitude than the 30% standard project flood, permit discharge of 9.300 cubic feet per second from Lake Okeechobee during periods when canal capacity was not required for tributary area drainage, and to provide salinity control between Ortona and Olga by maintaining the normal pool stage above Olga at optimum water levels. These objectives were accomplished at some expense to the natural functioning of the watershed.

RESTORATION BENEFITS: The Caloosahatchee Water Management Plan was initiated in 1997 to restore, preserve and protect the ecosystem of the estuary and watershed, while providing for the present and future water supply needs of urban and agricultural users. Components of the project include; (1) assessment of existing data in the watershed, (2) identification of additional data needs, (3) development of a watershed management plan to meet natural system goals, (4) dissemination of implementation strategies to ensure adequate water supplies for all users and the natural system, (5) enhancement of recreational opportunities, and (5) restoration of natural hydro-patterns. The Caloosahatchee Water Management Plan will benefit the Caloosahatchee Estuary restoration, Charlotte Harbor National Estuarine Program, and will complement the Corps of Engineers Comprehensive Restudy goals for water supply and water quality.

Time Line and Fiscal Year Budget (in thousands of dollars) for Caloosahatchee River

Task	97	98	99	00	01	02	03	04	05	Unprog	Total
Nutrient Monitoring		■	■	■							
Water Supply Assessment	■	■	■	■							
Water Demand Assessment	■	■	■	■							
Water Storage Modeling		■									
Water Supply & Demand Modeling		■									
Environmental Assessment	■	■	■	■							
Plan Implementation			■	■	■	■	■	■	■		
Project											
SFWMD	500	1,700	1,100	950	10,000	20,000	30,000	25,000	15,000		104,250
USACE	0	0	0	100	10,000	20,000	30,000	25,000	15,000		100,100

TITLE: Stock Structure and Abundance of Bottlenose Dolphins along Florida's West Coast

SUBREGION : 2	***PROJECT ID:*** GL59	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research		
PROJECT PLAN MANAGER: Steve Swartz 305/361-4487	***BASIS:*** 3	***TOTAL:*** $296,717	
LEAD ORGANIZATION(S): NMFS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): Chicago Zoological Society, Mote Marine Laboratory, Earthwatch			
COUNTY(S): Lee (and Charlotte, Sarasota, Manatee, Hillsborough)		***TOTAL:*** $132,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $164,717	
START: 1990	***END:*** 2000	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The NMFS is responsible for establishing quotas for incidental takes of bottlenose dolphins (Tursiops truncatus) and for monitoring their populations. In 1987, NMFS began funding several local research efforts in the southeast U.S. to detect large-scale changes in abundance and establish archival databases for trend detection. The Charlotte Harbor/Pine Island Sound area has been of particular interest because of its past use for commercial dolphin collection. It is also near the long-term study sites of Sarasota Bay and Tampa Bay. Extension of the survey to include this area completed a nearly 200-km section of contiguous coastline for which movement patterns of dolphins could be determined. Since 1990, various surveys have been conducted both inside and offshore of Charlotte Harbor and Pine Island Sound, primarily using the methodology of photographic identification. Objectives were to establish a current population size and vital rate parameter database for long-term population trend detection, investigate long-term residency and movement of dolphins, and establish a current dorsal fin photograph catalog of identifiable dolphins in the area. During 1997-98, a monthly photo-ID survey is being conducted offshore of the well-studied inshore stocks to optimize the ability to discern interactions between stocks. In 1998, photo-ID surveys will be made in Charlotte Harbor/Pine Island Sound to investigate seasonal changes in abundance relative to stock structure, evaluate interactions between inshore and Gulf dolphins, and update abundance estimates. As part of a larger study during 1998-2000, similar surveys will attempt to relate ranging patterns to stock structure of dolphins in offshore waters between Tampa Bay and Charlotte Harbor. A planned network of study sites to target bottlenose dolphin populations could include locations further south on Florida's Gulf Coast.

RESTORATION BENEFITS: The status of bottlenose dolphins along the Gulf Coast are of concern because of several large mortality events since 1990, habitat degradation due to coastal development, and pervasive pollution. Inshore stocks are currently identified on the basis of bay and estuary boundaries and coastal stocks on the basis of geography and water depth. Interactions between inshore and coastal stocks remain largely undefined. Risk assessment must account for stock interactions, and to fully understand the implications of management decisions or catastrophic events the biological basis of stock designations must be evaluated. The origins of individuals determine their exposure to disease and risk of transmission; movement of individuals between stocks can have potentially serious impacts. Stock designations could provide information on dolphins' history of exposure to contaminants and potentially lead to mitigation of pollution sources.

Time Line and Fiscal Year Budget (in thousands of dollars) for
Stock Structure and Abundance of Bottlenose Dolphins along Florida's West Coast

Task	98	99	00	01	02	03	4	05	06	07	08	09	10	Unprog	Total
Coastal Survey Harbor/Sound Survey Coastal Survey															
Project															
12-month Coastal Survey	24.0														24.0
Harbor/Sound Survey	49.9	12.2													62.1
Coastal Survey	10.4	64.6	27.6												102.6
Subtotal	84.3	76.8	27.6												188.7

TITLE: Fish Abnormalities as Environmental Quality Indicators in the St. Lucie - Lower Indian River			
SUBREGION : 2	***PROJECT ID:*** GL60	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research		
PROJECT PLAN MANAGER: Joan Browder 305/361-4270	***BASIS:*** 1, 2	***TOTAL:***	$100,000
		APPROPRIATED TO DATE:	
LEAD ORGANIZATION(S): NMFS			
SUPPORTING ORGANIZATION(S): AmeriCorps, FDEP/FMRI		***TOTAL:***	$9,200
COUNTY(S): Martin			
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** UEC12-M		***TOTAL:***	$ 90,800
START: 1996	***END:*** Until completed	***APPROVED:***	***LAST REVISION:*** 10/17/97

DESCRIPTION: This study was prompted by observations of abnormalities in fish of the St. Lucie - Lower Indian River estuary. Occurrence of morphological deformities (both skeletal and scale), tumors, and lesions suggests that the fish communities in this system are considerably stressed. A growing body of scientific information indicates that the prevalence of these types of abnormalities is an indication of the degree of stress. Any or all of several potential anthropogenic stressors present in the St. Lucie-Lower Indian River estuary might be the cause of poor fish health. These include sporadic and extraordinarily high freshwater discharges, excessive nutrients, and accumulation of contaminants such as organic pesticides and heavy metals in bottom sediments. This field survey is the first to quantitatively determine the scope and magnitude of the problem. Objectives of the first phase of the project are to: 1) determine prevalences of fish with externally visible abnormalities, such as scale disorientation, deformed or missing dorsal spines, saddleback, miniature tail, lesions, ulcers, tumors, and parasites; 2) describe the variation in prevalences among species; and 3) describe the spatial and temporal variation in prevalences of types of abnormalities. This study will provide a baseline from which to evaluate the effectiveness of the South Florida Ecosystem Restoration initiative in improving ecological conditions in the St. Lucie-Indian River estuary. Future work will attempt to relate prevalences to habitat quality, as characterized by such factors as sediment contaminant concentrations, proximity to dredging, influence of high fresh water discharges, and presence of toxic dinoflagellates.

RESTORATION BENEFITS: Quantifiable measures of ecological integrity are sought by the South Florida Ecosystem Restoration Program in order to identify areas needing restoration action and evaluate results of restoration efforts. Fish health appears to be a reliable indicator of the health of coastal waters. Readily recognizable signs of condition of aquatic organisms can provide the basis for one quantifiable index of a system's ecological integrity for use in South Florida's coastal waters. A quantitative estimate of the prevalence of fish deformities will enable decisionmakers and water management planners to understand this problem and expedite efforts to stop degradation of a significant aquatic habitat. Development of a long-term monitoring program will allow determination of success of restoration efforts.

Time Line and Fiscal Year Budget (in thousands of dollars) for
Fish Abnormalities as Environmental Quality Indicators in the St. Lucie - Lower Indian River

Task	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Quantitative survey	■	■													
Relation to habitat	■	■	■	■											
Project															
NMFS	20.0	35.0	30.0	5.8											90.8
Subtotal	20.0	35.0	30.0	5.8											90.8

TITLE: Charlotte Harbor National Estuary Program			
SUBREGION : 2 (and 5)	***PROJECT ID:*** GL61	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Water Quality and/or Habitat Protection, Information Management, Monitoring		
PROJECT PLAN MANAGER: Tiffany Lutterman 941/995-1777	***BASIS:*** 1, 3	***TOTAL:*** $3,707,000	
LEAD ORGANIZATION(S): USEPA (Southwest Florida Regional Planning Council is local administrator)		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): SFWMD, SWFWMD, Central Florida Regional Planning Council, FDEP, FDCA, and many county and municipal governments (see counties below).			
COUNTY(S): Lee, Charlotte, Highlands, Polk, Hardee, DeSoto, Manatee, Sarasota		***TOTAL:*** $1,460,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $2,247,000	
START: 10/96	***END:*** Until complete	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The Charlotte Harbor National Estuary Program (CHNEP) is addressing three categories of issues on a regional basis. Together with existing public and private institutions, the program is developing management strategies and implementing solutions for 1) fish and wildlife habitat loss, 2) hydrologic alterations, and 3) water quality degradation. The CHNEP study area includes the watersheds of the tidal Caloosahatchee River, along with Charlotte Harbor, Pine Island Sound, and San Carlos Bay; watershed of Estero Bay (Subregion 5); and watersheds of the Peace River, Myakka River, Lemon Bay, and coastal Venice areas (under jurisdiction of the Southwest Florida Water Management District). The CHNEP supports monitoring efforts, regional data management initiatives, science and data collection, habitat restoration, and development of a "Comprehensive Conservation and Management Plan."

RESTORATION BENEFITS: The CHNEP will contribute to ecological protection and restoration in the Charlotte Harbor basin by improving fish and wildlife habitat, water quality, and hydrology through public support, improved interagency communication, and additional funding for local projects.

Time Line and Fiscal Year Budget (in thousands of dollars) for Charlotte Harbor National Estuary Program

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Early Action Demonstration Projects																533
Conservation & Management Plan Development																1,574
Plan Implementation																1,600
Project																
Subtotal	813	647	647	400	400	400	400									3,707

TITLE: Seagrass Studies in Indian River Lagoon			
SUBREGION : 2 (and 4)	***PROJECT ID:*** GL62	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research, Natural Resources Management		
PROJECT PLAN MANAGER: Jud Kenworthy 919/728-8750	***BASIS:*** 3	***TOTAL:***	$554,400
LEAD ORGANIZATION(S): NMFS, FWS		***APPROPRIATED TO DATE:***	
		NMFS	$ 48,000
		SFWMD	$ 50,000
SUPPORTING ORGANIZATION(S): SFWMD, FDEP/FMRI, SJRWMD, FIT, HBOI, Smithsonian Marine Station		FWS	$120,000
COUNTY(S): Martin, St. Lucie, Palm Beach (and Indian River)		***TOTAL:***	$218,000
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:**		NMFS	$251,400
Critical to:		FWS	$ 85,000
Associated with: GL19		***TOTAL:***	$336,400
START: 1987	***END:*** Until completed	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: In the Indian River Lagoon, a goal of preservation or restoration of seagrass habitability to depths of 2 m has been established. To accomplish this goal, information is needed on topics such as minimum light requirements for seagrasses, light attenuation, and water quality effects on transparency and seagrass distribution. The Beaufort, N.C., laboratory of the NMFS has been investigating seagrasses of the southern IRL since the late 1980s. Published studies include the light requirements of *Halodule wrightii* and *Syringodium filiforme* and application of an optical water quality model to determine seagrass depth limits. Extensive field work in the IRL, including Hobe and Jupiter Sounds and the Fort Pierce Inlet, led NMFS to propose that *Halophila johnsonii* (Johnson's seagrass) be added as a threatened species to the U.S. List of Endangered and Threatened Plants. This is the rarest seagrass species in Florida and has one of the most limited geographical distributions of any seagrass species in the world, limited to the east coast of Florida from central Biscayne Bay north to Sebastian Inlet. Critical habitat has been proposed for five areas that encompass the largest known contiguous populations of Johnson's seagrass: Sebastian, Fort Pierce, St. Lucie, Jupiter, and Lake Worth inlets. Proposals include research to develop and evaluate light requirements and successful transplanting methodologies for Johnson's seagrass and to determine its genetic and reproductive characteristics.

RESTORATION BENEFITS: Seagrass has been identified as the most critical habitat in the IRL, but seagrass beds in the lagoon have declined dramatically since the 1940s. Based on its rarity and limited distribution, Johnson's seagrass is being evaluated for Federal listing as a threatened species. Results of proposed work on light targets and transplanting techniques would be incorporated into long-range protection and recovery plans for this species. Light targets could be implemented for this species to protect existing populations, and transplantation could be used for restoration in impacted areas.

Time Line and Fiscal Year Budget (in thousands of dollars) for Seagrass Studies in Indian River Lagoon

Task	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Light intensity monitoring	■														
Transplants	■	■													
Genetics	■	■													
Mesocosms	■	■	■												
Recovery Team	■	■	■												
Analyses, report			■												
Project															
FWS	36														36
Cooperators	49														49
NMFS	111.4	85	55												251.4
Subtotal	196.4	85	55												336.4

3.4 *CENTRAL EVERGLADES*
Sub-Region 3

ECOLOGICAL SETTING

The Central Everglades Sub-region consists of the Water Conservation Areas (WCA's), A.R.M. Loxahatchee National Wildlife Refuge, Everglades National Park (including Florida Bay to the park boundary), western portions of the C-102 and C-103 basins, the C-113 basin, the Southern Glades, and Model Lands.

The WCA's encompass 1,350 square miles and represent an area equivalent to about one-third of the historic Everglades landscape. This area has been protected from development but greatly modified by channelization and diking. The WCA's are five interconnected, diked impoundments situated downslope (south) of Lake Okeechobee and immediately upslope (north) of Everglades National Park (ENP). WCA No. 1 is entirely within Loxahatchee National Wildlife Refuge (LNWR). The WCA's are wedged between the developed Atlantic Coastal Ridge (Lower East Coast, LEC), the Everglades Agricultural Area (EAA) and Big Cypress National Preserve.

The WCA's provide many functions. In addition to providing water to most of the remaining Everglades habitat, they also provide water control functions including water storage, water supply, and flood control. The levee system to the east prevents flood waters from inundating the principally urban LEC, while the canals provide water supply for the agricultural lands and ENP. The WCA's enhance water supply to the LEC by recharging the Biscayne Aquifer, the primary drinking water source for the urban area, and by retarding saltwater intrusion.

All of these functions are to be accomplished in a manner beneficial to the abundant wildlife resources dependent on the system. The WCA's contain the last remnants of the tall-sawgrass landscape, as well as the bulk of deep marshes, wet prairies, and tree island hammocks still remaining outside ENP. The WCA's are critically important to a diverse array of wildlife resources, particularly wading birds (including the endangered wood stork), the American alligator, and the endangered snail kite. Grass shrimp, crayfish, and select fish species are well adapted to the periodic wet/dry regimens that characterize the Everglades.

LNWR preserves the largest and most pristine remaining section of the northern Everglades. It is designated as critical habitat for snail kites and as an Outstanding Florida Waters. Thousands of tree islands, sloughs, wet prairies, and sawgrass plains characterize LNWR. It contains some of the deepest peat layers left in the Everglades. LNWR is surrounded by urbanization to the east and agriculture to the west.

The non-marine southern Everglades portion of the sub-region is coincident with the freshwater and terrestrial portions of Everglades National Park (ENP) and the adjacent authorized East Everglades acquisition lands. Established in 1947, this is the first national park created to protect a threatened ecological system. It is a wetland of international importance and has been named an International Biosphere Reserve and a World Heritage Site.

The mainland portion of ENP, predominately a mosaic of flat, seasonally flooded marshes and prairies with interspersed forested islands, is dependent on alternating wet and dry seasons. It has a high biotic diversity with a unique mixture of temperate and tropical species. This includes a large number of endangered animal species and of endemic plant species with highly specific habitat requirements.

The sub-region also includes the agricultural area east of C-111 in southern Dade County that drains into C-111 from the C-102 canal west of S-194, the C-113 canal, the C-103 canal west of S-196, and the C-111E canal. This area is utilized for production of a wide variety of vegetables and tropical fruits.

The sub-region includes the portion of Florida Bay within the ENP boundaries. Florida Bay is an 850-square-mile mosaic of shallow-water banks and relatively deeper basins connected by deep narrow channels. It is dotted with hundreds of small islands or "keys" rimmed with mangroves. Until recently clear waters and lush seagrass meadows characterized the Bay.

Florida Bay is the principal inshore nursery for the offshore Tortugas pink shrimp fishery. It provides critical nursery habitat for other important recreational and commercial fishery species, such as spiny lobster, red drum, and spotted seatrout. The Bay also supports numerous protected species, including bottle nosed dolphin, sea turtles, manatees, and American crocodile. About 85 percent of Florida Bay lies within Everglades National Park; while the remainder lies within the FKNMS.

The Southern Glades and Model Lands consist of a broad southern coast marsh prairie, with a relatively narrow fringing belt along the coastline of mangrove swamps. Under natural conditions, the southern coast marsh prairie occurred in a relatively limited area in Florida, inland from the coast in an area from east of Homestead to an area between Long Pine Key and the broadening belt of mangrove swamps north of Cuthbert and West Lakes. These prairies were separated from Shark Slough and its flanking southern Everglades marsh prairies by the Miami Rockland pine ridge.

LINKAGE TO THE TOTAL SYSTEM

The WCA's are integral to the restoration effort. They include the largest remaining area of undeveloped Everglades. LNRW is currently managed in a manner that emphasizes preservation of the natural habitat in order to promote wetland species health and biodiversity. The WCA's also serve as storage areas for excess water from Lake Okeechobee and the EAA, thus providing flood control for the LEC urban area. Water stored in the WCA's augments the LEC water supply by recharging the Biscayne Aquifer and retarding saltwater intrusion. Management of the WCA's also controls water flow into ENP.

Water from the mainland portion of ENP flows south to provide fresh water to the Park's mangrove fringe and Florida Bay. ENP, in turn, is directly dependent on Lake Okeechobee and the Water Conservation Areas for fresh water and is subject to contaminants transported from these areas. Because it is situated so close to a major metropolitan area, ENP faces serious threats. The water that supports Everglades resources is also in demand by urban residents and the agriculture industry. These demands for water and flood control are the source of many of the present problems in ENP.

Agricultural areas within the C-111 basin drain primarily either into Taylor Slough via the L-31W canal and pump station S-332 or to the panhandle of ENP via the lower C-111. Since these areas were historically within the Taylor Slough basin, the runoff volume is important to the area's slough hydrology. Under some conditions, flows also are discharged eastward to Biscayne Bay. These waters aid in maintaining a freshwater head which prevents salt water intrusion.

The water of Florida Bay is a mixture of freshwater runoff from the Everglades and water from the Gulf Coast that is transported around Cape Sable from the West Florida Shelf. Periodically, the reef tract is inundated by water from Florida Bay that escapes seaward through these same channels.

Inland areas of South Florida are the source of fresh water to the coastal areas. Florida Bay and South Biscayne Bay are the receiving waters for discharges from several water management canals. These serve as direct links to upstream areas and are a source of nutrient and contaminant contributions from urban and agricultural areas. Also, Dade County ground water is the primary source of drinking water for the Florida Keys; thus, wellfield contamination problems have a direct impact.

The Southern Glades and Model Lands areas receive a dominant portion of their inflows from direct rainfall. The Southern Glades area provides sheetflow across the lower C-111 and into the ENP panhandle area. The Model Lands area provides sheetflow to the lower Biscayne Bay.

ECOSYSTEM PROBLEMS AND RESTORATION OBJECTIVES

Both water quality and quantity in the WCA's have been severely impacted as a result of their location between urban and agricultural development, and the water management operations of the C&SF Project. In particular, LNWR receives the highest average annual phosphorus loadings of all other WCA's as well as ENP. LNWR also receives higher amounts of some pesticides, the effects of which are unknown.

Since a major portion of the Kissimmee/Okeechobee and Atlantic Coastal Ridge drainage is diverted to sea for regulatory flood control, historic hydrologic flow through the WCA's is severely reduced. The areas have been virtually isolated from the Kissimmee and Okeechobee watersheds, and the sheetflow that was a critical element in the formation and ecological structure and function of the Everglades landscape has been eliminated.

There have been major hydroperiod impacts resulting from impoundment of these areas. Channelization coupled with impoundment has increased depth and hydroperiods at the southern end of the systems, while dewatering and shortening hydroperiods in the northern end. One result is extensive invasion by exotic plants, such as melaleuca, as well as numerous exotic fish. Another is the shortening of hydroperiods and reduction in water coverage vital to successful wading bird reproduction. This is particularly critical since these units provide major rookery and foraging habitat for wading birds in normal and dry years. Because of the multiple Congressionally authorized functions that WCA No. 1 must satisfy, it is not possible to adopt a regulation schedule that is completely consistent with the purpose for which LNWR was established.

With drainage and development of the

EAA, the WCA's serve as retention/ detention systems for water storage and for input of agricultural drainage. However, LNWR was established to mitigate the loss of Everglades lands to agriculture but has suffered, due to its location, as a support for agriculture. Chronic introduction of drainage waters with elevated concentrations of nutrients, especially phosphorus, has resulted in massive conversions of sawgrass and wet prairie communities to stands of cattails and cattail/sawgrass mixes.

In Everglades National Park, changes in the natural hydrologic cycle include water levels, surface-water inundation, and water flow. Completion of the Tamiami Trail in 1928, the first east-west road across the basin, altered and interrupted water patterns and blocked all natural sheetflow. Present flow patterns in ENP are limited and controlled by management of the WCA's to the north, extensive agricultural and urban pumping, and drainage canals to urban areas to the north and east. Unnatural hydroperiods and hydropatterns throughout the Everglades are now typical, resulting in sharp reductions of seasonal water levels and large discharges for flood control purposes. These have been both ecologically significant and deleterious. Groundwater from the Biscayne Aquifer flows into Biscayne Bay modifying salinity and possibly carrying pollutants into the Bay waters.

The Everglades are presently subject to intense disruptions of historic geochemical processes due to human activities along its margins and, to some extent, from atmospheric transport. With the advent of intense land-use change, notably artificial drainage, cultivation within the Everglades Agricultural Area (EAA) and development of the Atlantic Coastal Ridge, phosphorus and other substances are delivered to the Everglades in quantities significantly above historic levels. One consequence of such enrichment is extensive development of cattail stands in phosphorus-enriched areas formerly dominated by sawgrass.

Changes in water quality, quantity, and distribution have had ramifications throughout the Everglades. The total number of wading birds nesting in the Big Cypress and Everglades basins has declined by more than 95 percent from peak estimates of nesting birds in the 1930s.

Understanding the relationships between a decline in wading birds and changes in hydropatterns that have resulted from water management practices will require increased study of (1) the dynamics of prey populations and (2) specific foraging strategies and patterns associated with successful nesting of wading birds. Some of the changes in aquatic communities that form the food base for wading birds are subtle and difficult to detect in the early stages until they are manifested in obvious collapses of native communities and natural processes. A good example is the recent finding of mercury at dangerous levels in fish and their predators.

Also, non-native fish have colonized natural and disturbed habitats during the past three decades. The rate at which fish have been introduced has increased since the mid-1970's. Several introduced species of herpetofauna also occur in ENP, and colonization will likely continue.

Water management strategies have caused reduced reproductive effort, increased frequencies of nest flooding, and increased rates of juvenile mortality for the American alligator, one of the

most ecologically significant of the larger vertebrates in the Everglades.

The continuing and possibly accelerating loss of species diversity of both flora and fauna from upland communities is of great concern. Invasion of the natural vegetation communities by exotic pest plants like the melaleuca and Brazilian pepper, is one of the most serious problems in ENP. Likewise, the extent of the melaleuca and Old World climbing fern in LNWR is a serious threat to the integrity of its wetland ecosystem. It is possible these and other invasive species may modify the water table and hasten extinction of native species.

Water levels required for flood protection in adjacent agricultural areas result in excessive seepage of water from the Everglades. This results in not only a loss of water from the natural system, but also significantly reduced water levels in the historic headwaters of Taylor Slough. Additionally, the seepage water into C&SF Project canals impacts the ability of the flood control system to prevent agricultural flood damages during wet conditions. Agriculture in this basin has experienced severe damages as a result of large storm events.

In Florida Bay a series of changes has become evident since 1987 that indicates acute ecosystem stress. These include:

- Diminished water clarity;
- Extensive die-off of seagrass habitat in western Florida Bay (no such loss has previously been observed in the Bay, nor reported in the literature);
- Decline of mangroves on Bay islands;
- Increased phytoplankton blooms;
- Reduced populations in such species as pink shrimp, sponges, spiny lobster, and game-fish; and;
- Increases in salinity (the Bay now exhibits high salinity, even hyper-salinity, throughout the year because of decreased freshwater inflow).

Vast areas of hardwood hammocks have already been lost to development. Remaining stands are highly fragmented, but are critical to dispersal and movement of the white-crowned pigeon and migratory birds, as well as for protection of many rare plants and animals.

Efforts are focused on redirecting freshwater and sheetflow into northern Florida Bay; however, there is concern that measures to direct more flow to the Everglades may bring new problems to Florida Bay. These may include an increased nutrient contribution, which could cause more algal blooms, and increased contaminant input to the ecosystem, especially pesticides.

In the Southern Glades and Model Lands area, drainage, agricultural practices, invasion by exotic plants, and excessive fires have degraded the ecosystem. Major changes include: the encroachment of mangrove vegetation into areas that formerly were marsh prairies, the conversion of expansive areas of marsh prairies into thickets of willow and other shrubs, and the introduction of exotics such as Casuarina, Melaleuca, Schinus, and others.

RESTORATION OBJECTIVES:

The restoration objectives of critical importance for the Central Everglades sub-region are listed below:

- Reestablish historic pre-drainage

hydrologic gradients, dynamic storage, and sheetflow.

- Reestablish rainfall-driven hydrology.
- Restore connectivity between WCA's.
- Restore pre-drainage water quality.
- Restore pre-drainage landscape and ecological integrity.
- Control exotic plants and animals.
- Restore pre-drainage fire frequency and spatial boundary.

The Restoration objectives for the non-marine portion of Everglades National Park are listed below:

- Restore or maintain natural quantity, distribution, and timing of hydrologic flows and levels.
- Restore or maintain water quality.
- Restore or maintain natural vegetation and soil conditions.
- Increase long-term natural productivity of fish and invertebrate communities.
- Increase populations of top predators.
- Reverse or arrest biodiversity declines in all landscapes, particularly uplands.
- Satisfy water management needs on tribal lands consistent with other restoration objectives.

The restoration objectives for the south Dade agricultural area in the C-111 basin are listed below:

- Maintain sustainable agriculture in south Dade County that is compatible with hydrologic restoration of the Everglades.
- Reduce water management conflicts between the needs of agriculture and the needs of the natural system.
- Prevent use of agricultural herbicides or pesticides that are harmful to the ecosystem.
- Increase the use of Best Management Practices that prevent adverse impacts to the natural system.

The restoration objectives for Florida Bay are listed below:

- Restore water budgets, circulation dynamics, and salinity.
- Restore water quality and nutrient cycling.
- Restore seagrass, mangrove, coral reef and other habitats.
- Preserve upland biological communities.
- Protect and restore endangered species populations.

The restoration objectives for the Southern Glades and Model Lands areas area listed below:

- Restore or maintain natural quantity, distribution, and timing of hydrologic flows and levels.
- Restore or maintain water quality.
- Restore or maintain natural vegetation and soil conditions.
- Increase long-term natural productivity of fish and invertebrate communities.
- Increase populations of keystone predators.
- Reverse or arrest biodiversity declines in all landscapes, particularly uplands.

- Control fires to a frequency that is compatible with the health of the ecosystem.

- Provide flows to Florida Bay and southern Biscayne Bay that enhance conditions in the estuarine environment.

- Control the invasion of exotic plant species.

RESTORATION PROJECTS

Important restoration projects in progress or proposed for the Sub-region are identified on the following pages:

TITLE: WCA-2A Regulation Schedule Review			
SUBREGION : 3	***PROJECT ID:*** CE01	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Area Management	USACE: $500,000	
PROJECT PLAN MANAGER: K. Brooks-Hall 904-232-3155	***BASIS:*** 2	***TOTAL:*** $500,000	
LEAD ORGANIZATION(S): USACE		***APPROPRIATED TO DATE:*** USACE: $0	
SUPPORTING ORGANIZATION(S): SFWMD			
COUNTY(S): Palm Beach, Broward		***TOTAL:*** $0	
LINKED PROJECTS: **Dependent on :** **Critical to:** **Associated with:**		***REMAINING FINANCIAL REQUIREMENT:*** USACE: $500,000	
		TOTAL: $500,000	
START: 1998	***END:*** 2000	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: A revised regulation schedule was implemented for Water Conservation Area No. 1 (WCA-1) (Loxahatchee National Wildlife Refuge) in 1995. The schedule was modified to improve water conditions for wading bird and snail kite habitat. Implementation of the revised regulation schedule has already shown benefits. When the WCA-1 regulation schedule modifications were approved, it was agreed that the WCA-2A regulation should also be reviewed to evaluate opportunities for similar benefits. The review will be initiated in FY98.

RESTORATION BENEFITS: The purpose of the project is to evaluate the feasibility of modifying operational modifications for WCA-2A to benefit its fish and wildlife resources, without adversely impacting the area's ability to satisfy its flood control and water supply purposes. The study can be implemented with existing operational and maintenance authority. It can be funded through ongoing O&M appropriations for the Corps of Engineers. It will be initiated in FY98.

Time Line and Fiscal Year Budget (in thousands of dollars) for WCA-2A Regulation Schedule Review																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
USACE		200	200	100												500
Subtotal																**$500**

TITLE: Water Conservation Areas: Inholdings, Mineral Rights, and Other Interests			
SUBREGION : 3	***PROJECT ID:*** CE02	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** 1	SFWMD $18,028,792	
PROJECT PLAN MANAGER: Rinaldi (561)687-6537	***BASIS:*** 2,3	***TOTAL:*** $18,028,792	
LEAD ORGANIZATION(S): SFWMD		***APPROPRIATED TO DATE:*** SFWMD $9,228,792	
SUPPORTING ORGANIZATION(S): None			
COUNTY(S): Palm Beach, Broward		***TOTAL:*** $9,228,792	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		SFWMD $8,800,000	
		TOTAL: $8,800,000	
START: 1948	***END:*** 2010	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The WCA's include approximately 256,000 acres in Broward, Dade, and Palm Beach counties. The acquisition program is attempting to purchase all outstanding mineral rights on approximately 250,000 acres and fee title rights on less than 70,000 acres. Land Management is carried out by the FGFWFC and the U.S. Fish and Wildlife Service, under contract to the SFWMD.

RESTORATION BENEFITS: The general purpose of these lands is to store floodwater from developed areas adjacent to the WCA's for later use during the dry season. Releases of water from the WCA's during the dry seasonal and, particularly during drought conditions are considered vital to the maintenance of adequate water levels in the coastal canals, wellfields, and Everglades National Park and for the prevention of saltwater intrusion.

Time Line and Fiscal Year Budget (in thousands of dollars) for Water Conservation Areas: Inholdings, Mineral Rights, and Other Interests

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
Land Acq	200	200	200	200	200										7,800	8,800
Subtotal																**$8,800**

TITLE: Soil Survey for Everglades National Park, Big Cypress, & Water Conservation Areas			
SUBREGION : 3	***PROJECT ID:*** CE05	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Natural Resources Management	NRCS $4,280,000	
PROJECT PLAN MANAGER: Greg Hendricks (561) 795-5451	***BASIS:*** 3	***TOTAL:*** $4,280,000 (unfunded)	
LEAD ORGANIZATION(S): NRCS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): NPS, USGS, IFAS			
COUNTY(S): Palm Beach, Broward, Dade, & Monroe		**Total** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:**		NRCS $4,280,000	
Critical to: TS01, TS40, TS41, TS55, TS56			
Associated with: TS19, TS22, TS45		***TOTAL:*** $4,280,000	
START: 1997	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project will produce a comprehensive soil survey of Everglades National Park (ENP) and the Water Conservation Areas (WCA's) throughout south Florida, consisting of approximately 2,000,000 acres. This soil survey will consist of a spatial representation of soil map units and series across the national park and WCA landscape. A detailed soil series description will be developed that describes each of the soil profiles, sequence of layers from the surface to rock, and other important physical, biological and ecological features.

RESTORATION BENEFITS: Presently there is no soil survey available to land managers and planners at the ENP or WCA's at a level of detail that compares with that which will be produced by this product. Information provided by this detailed soil survey will deliver to land managers an effective tool that will assist them in the restoration and/or preservation of key landscape features necessary for the sustainability of their land and water management objectives. Ecological communities are highly correlated to soil series for which they are associated. Key soil characterization data will be used by land and water managers to guide the restoration and/or management of desired plant communities. Other benefits include development of key information that will be required for new hydrologic and ecologic models being developed.

Time Line and Fiscal Year Budget (in thousands of dollars) for Soil Survey for Everglades National Park, Big Cypress, & Water Conservation Areas

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
NRCS																
Project																
NRCS		550	1060	1060	1060	550										4,280
Subtotal																$4,280

TITLE: Canal C-111 Project			
SUBREGION : 3	***PROJECT ID:*** CE06	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Infrastructure Investment	USACE: $87,564,000 SFWMD: $73,729,000 NPS (Land): $0	
PROJECT PLAN MANAGER: Glenn Landers, 904-232-2125	***BASIS:*** 1	***TOTAL:*** $161,293,000	
LEAD ORGANIZATION(S): USACE		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): SFWMD, ENP, DEP, FWS		USACE: $22,290,000 SFWMD: $71,790,000 See Note	
COUNTY(S): Dade		NPS(Land): $0 See Note ***TOTAL:*** $94,080,000	
LINKED PROJECTS: **Dependent on:** CE10, CE12, **Critical to:** CE13 **Associated with:** CE08, CE11, CE12 CE14		***REMAINING FINANCIAL REQUIREMENT:*** ***TOTAL:*** To Be Determined: See Notes Below	
START: 1994	***END:*** 2005	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

NOTE 1: Financial requirements shown above are based on the original project scope and current Project Cooperation Agreement (PCA). The original project lands cost estimate of $50,690,000 did not include state conservation lands (Southern Glades) needed to implement the C-111 project. WRDA 1996, Section 316, changed cost sharing for C-111 project implementation to 50% Federal and 50% Local including credit for Southern Glades lands. The U.S. Army Corps of Engineers (USACE) is currently preparing a Real Estate Design Memorandum (REDM) Supplement to detail the estimated revised project lands costs. After approval of the REDM, the PCA will be amended to implement 50/50 cost sharing per WRDA 1996 and project financial requirements shown above will be updated.

NOTE 2: WRDA 1996, Section 316, also states "The Secretary of Interior shall pay 24% of the cost of acquiring such portions of the Frog Pond and Rocky Glades areas as are needed for the project." The Corps REDM Supplement will detail the cost of acquiring these lands. Current total cost estimate for the Frog Pond and Rocky Glades is approximately $110,650,000.

DESCRIPTION: The goal of the C-111 Project modifications is restoration of the Taylor Slough and eastern panhandle of Everglades National Park, while maintaining flood protection within the C-111 basin east of L-31 N and C-111. The project plan consists of both structural and nonstructural modifications to the existing project works within the C-111 basin. Structural components of the plan include: construction or modification of nine canals, construction of an L-31 Tieback levee and S-332D tieback levee, removal of existing spoil material along the south side of lower C-111, construction of five pump stations, and replacement of an existing bridge over Taylor Slough in ENP. The project will require the acquisition of lands in the Frog Pond; the Rocky Glades Agricultural Area (L-31N lands); and additional lands in the Southern Glades. The SFWMD has completed acquisition of the Frog Pond and acquisition of the remaining lands is underway. These modifications will widen the areal extent of water distribution capability, thereby restoring more natural hydrology in 128 square miles of the Taylor Slough and its headwaters in the Rocky Glades.

RESTORATION BENEFITS: The goal of this project is to restore more natural timing, distribution, and quantity of freshwater flows to Taylor Slough and the wetlands in the panhandle of ENP. Restoring the natural hydroperiods will help to restore and maintain natural vegetation communities in these regions of ENP. The detention/retention area will also contribute to improving the water quality of waters delivered to ENP.

Time Line and Fiscal Year Budget (in thousands of dollars) for Canal C-111 Project

Task	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Design	■	■	■	■	■										
Land Acquisition	■	■													
Construction	■	■	■	■	■										
Completion						■									
Project															

Annual Federal and non-Federal cost Allocation will be based on the negotiated Project Cooperation Agreement.

TITLE: East Cape and Homestead Canal Plugs Repair			
SUBREGION : 3	***PROJECT ID:*** CE07	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Infrastructure		
PROJECT PLAN MANAGER: **Ring (305) 242-7710**	***BASIS:***	***TOTAL:*** $374,000	
LEAD ORGANIZATION(S): USACE		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): ENP			
COUNTY(S): Dade, Monroe		$235,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** CE06,CE10		***TOTAL:*** $0	
START: 1997	***END:*** 1997	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The East Cape and Homestead Canals were constructed to assist in the drainage of the Everglades prior to the authorization of Everglades National Park in 1936. After the park was established in 1947, the canals were plugged to prevent over-drainage of the upstream freshwater systems and saltwater intrusion during the high tides in the dry season. Hurricane Andrew resulted in both plugs being over-topped. Extensive damage occurred causing the plugs to leak badly and potentially fail. The Corps of Engineers has provided design assistance and funding to Everglades National Park to repair/replace the plugs. The park completed the scheduled work in FY97.

RESTORATION BENEFITS: The project will prevent the loss of freshwater from coastal lakes in the southern Everglades and prevent saltwater intrusion. This will help restore and protect natural hydrologic conditions. The project is authorized, funded, and competed.

STATUS: completed

Time Line and Fiscal Year Budget (in thousands of dollars) for East Cape and Homestead Canal Plugs Repair																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
USACE	235															235
Subtotal																**$235**

TITLE: Everglades National Park Water and Wastewater			
SUBREGION : 3	***PROJECT ID:*** CE08	***FINANCIAL REQUIREMENT:*** NPS Construction Budget	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Infrastructure Investment		
PROJECT PLAN MANAGER: Ring (305) 242-7710	***BASIS:*** 3	***TOTAL:*** $38,491,000	
LEAD ORGANIZATION(S): NPS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S):			
COUNTY(S): Dade		***TOTAL:*** $354,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $38,137,000	
START: 1997	***END:*** TBD	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: To rehabilitate or replace the water and wastewater systems at 17 areas within Everglades National Park.

RESTORATION BENEFITS: A large percentage of the existing water and wastewater systems within Everglades National Park were constructed over 25 years ago when the public health and environmental standards were not as fully evolved as they are today. While originally constructed to code, many of these systems fall short of meeting present day standards. This rehabilitation effort would modify or replace all of the existing systems with the new systems that offer the full level of public health and environmental protection that present day standards require. The final result will be potable water systems properly designed to provide safe, clean water and wastewater that are properly designed and provide sufficient treatment to fully protect the fragile water resources within Everglades National Park.

Time Line and Fiscal Year Budget (in thousands of dollars) for Everglades National Park Water and Wastewater

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
System Repair																
Project																
NPS	354	3,394														38,491
Subtotal																**$38,491**

TITLE: Hole-in-the-Donut			
SUBREGION : 3	***PROJECT ID:*** CE09	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Habitat Protection/Area Mgmt.	**Dade Co.** $75,000,000	
PROJECT PLAN MANAGER: Norland (305) 242-7800	***BASIS:*** 1	***TOTAL:*** $75,000,000	
LEAD ORGANIZATION(S): NPS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): DERM			
COUNTY(S): Dade		$ 5,839,129	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $69,160,871	
START: 1994	***END:*** 2017	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project will restore approximately 5,000 - 6,000 acres of wetlands within Everglades National Park by removing exotic vegetation (Brazilian pepper) and removing disturbed substrate to limestone bedrock.

RESTORATION BENEFITS: Invasive exotic pest vegetation is one of the greatest long-term threats to the Everglades ecosystem. As a result of this project, 5,000 - 6,000 acres of exotic vegetation will be restored to natural wetlands within ENP as mitigation for development projects in other areas of Dade County. A vast seed source with the potential to invade and disturb other areas of the Everglades will be eradicated.

Time Line and Fiscal Year Budget (in thousands of dollars) for Hole-in-the-Donut																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Reclamation																
Project																
Dade County	2387															71,548
Subtotal																**$71,548**

TITLE: Modified Water Deliveries to Everglades National Park			
SUBREGION : 7	***PROJECT ID:*** CE10	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Infrastructure Investment	NPS $131,500,000	
PROJECT PLAN MANAGER: Dick Ring (305) 242-7710	***BASIS:*** 1	***TOTAL:*** $131,500,000	
LEAD ORGANIZATION(S): ENP/USACE		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): SFWMD, DEP, FWS			
COUNTY(S): Dade, Broward		***TOTAL:*** $37,576,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** CE12, CE13 **Critical to:** CE06 **Associated with:** CE07, CE10, CE11 CE14			
		TOTAL: $93,924,000	
START: 1990	***END:*** 2006	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The project is being implemented in conjunction with acquisition of 109,578 acres in the East Everglades as part of the ENP Expansion. This project will involve: (1) construction of gaps or control structures in the L-67 levee to allow flow from WCA-3A to WCA-3B; (2) construction of water control structures to deliver a sheet flow of water to the NE Shark River slough; and (3) degradation of the L-67 extension levee south of Tamiami Trail and, (4) construction of a flood mitigation/seepage control feature to prevent adverse impacts to the 8.5 square mile residential area. Together, these efforts will restore historical hydroperiods in the southern portion of WCA-3A and WCA-3B, as well as the northern section of Shark River Slough, a total area of about 800 square miles.

RESTORATION BENEFITS: This project will restore historical hydroperiods and flows to WCA-3A, WCA-3B, and Shark River Slough, which will help to restore and maintain natural biological communities in ENP.

NOTE: It is critical that land acquisition be accelerated so all land is acquired prior to completion of the project works in 2006.

Time Line and Fiscal Year Budget (in thousands of dollars) for Modified Water Deliveries to Everglades Nat. Park[1,2]

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Design	■	■	■	■	■	■	■	■	■	■						
Land for Con.	■	■	■													
Construction	■	■	■	■	■	■	■	■	■	■						
Project																
USACE	2800	11900	14000	52000	13000	5500	2000	4900	1200	150					3117	
Subtotal																**$110,567**

[1] Figures are subject to periodic revision as a result of USACE inflation forecast.
[2] Figures are subject to revision as a result of possible elevation of US41 (Tamiami Trail)

TITLE: Additional Lands - 8.5 Square Mile Area			
SUBREGION : 3	***PROJECT ID:*** CE11	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	State 75 percent Federal 25 percent	
PROJECT PLAN MANAGER: Outland (904) 488-4892	***BASIS:*** 1, and 3	***TOTAL:*** $76,000,000 (estimated)	
LEAD ORGANIZATION(S): FDEP		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): USACE, SFWMD, Dade County			
COUNTY(S): Dade		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** CE10 **Associated with:**		***TOTAL:*** $76,000,000	
START: 1998	***END:*** Completion of acquisition (based on willing seller initiative)	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project consists of a willing seller land acquisition program for up to 5,013 acres consistent with the recommendations of the Governor's Committee on the 8 1/2 Square Mile Area. The acquisition area is in addition to the 1,065 acres included in the buffer/flow-way (see project titled East Coast Buffer Water Preserve Areas). The area was once historical pinnacle rock Everglades and under natural conditions was subject to seasonal flooding due to its topographic setting. Existing development in the area consists of agricultural and rural residential uses and a plethora of illegal land uses and activities (residential density violations, illegal structures and dumping).

RESTORATION BENEFITS: The acquisition of the remaining lands outside of the buffer/flow-way is needed to support water supply and protect water quality in the buffer/flow-way and adjacent Everglades National Park. Purchase will eliminate the potential for increased urban development that would decrease the effectiveness of the flood protection and water quality attenuation provided by the proposed buffer/flow-way.

TITLE: East Everglades Addition to Everglades National Park			
SUBREGION : 3	***PROJECT ID:*** CE12	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	State: (20%) Federal: (80%)	
PROJECT PLAN MANAGER: Ring (305) 242-7710	***BASIS:*** 1	***TOTAL:*** 106,060,000	
LEAD ORGANIZATION(S): NPS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): State of Florida		State: *$17,900,000 Federal: $61,150,000	
COUNTY(S): Dade		***TOTAL:*** $61,150,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** CE06, CE10 **Associated with:** CE06, CE10		State: $4,910,000 Federal: $40,000,000 ***TOTAL:*** $44,910,000	
START: 1990	***END:*** 2000	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: In 1989, Congress authorized the addition to Everglades National Park approximately 109,578 acres of an area known as Northeast Shark Slough and the East Everglades. The act also directed the Army Corps of Engineers to modify water management structures to allow the sheetflow of water and extend the hydroperiod to more closely resemble the historic Everglades. The USACE construction project is known as the Modified Water Deliveries to Everglades National Park.

RESTORATION BENEFITS: The East Everglades Addition is necessary to limit further losses suffered by the park due to habitat destruction outside former boundaries and to restore natural water-flow patterns that are critical to the ecological integrity and long-term viability of park resources. The acquisition of the East Everglades Addition lands and completion of the Modified Water Deliveries to Everglades National Park project are the most significant efforts underway to restore water deliveries to Shark Slough, the principal watershed in Everglades National Park. These hydrologic improvements are crucial to restoring ecosystem productivity in the southern Everglades and maintaining adequate freshwater inflow to the downstream estuaries along the Gulf of Mexico and Florida Bay.

The state has donated 42,959 acres and retains 2,181 acres in public ownership, another 13,109 acres have been acquired by the Federal Government, while another 5,005 acres are in condemnation leaving a total of 44,746 to be acquired.

NOTE: Restoration of natural flows cannot begin until land acquisition is complete. Land acquisition needs to be expedited to keep pace with the Corps construction efforts, which are projected for completion in 2006. To facilitate condemnation, appropriations are needed 2 years prior to taking possession.

*The State of Florida appropriated $17,900,000 to purchase the lands it subsequently donated to Everglades National Park.

Time Line and Fiscal Year Budget (in thousands of dollars) for East Everglades Addition to Everglades National Park

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Land Acquisition (Federal only)	[redacted]															
Project																
Land Acquisition		26000	20000	20,000												66,000
Subtotal																**$66,000**

TITLE: Experimental Program of Modified Water Deliveries to ENP			
SUBREGION : 7	***PROJECT ID:*** CE13	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Infrastructure	Federal - 100 percent CE06, CE10	
PROJECT PLAN MANAGER: Glenn Landers 904-232-2125	***BASIS:*** 1	***TOTAL:*** Included in C-111 & MWD Projects	
LEAD ORGANIZATION(S): USACE		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): ENP, SFWMD			
COUNTY(S): Dade, Broward, Monroe		***TOTAL:***	
LINKED PROJECTS: **Dependent on:** CE04 **Critical to:** CE10, CE06 **Associated with:** TS01		***REMAINING FINANCIAL REQUIREMENT:*** Included in funding for C-111 (CE06) & MWD (CE10) ***TOTAL:***	
START: 1985	***END:*** 2006	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The Experimental Program of Modified Water Deliveries to ENP was authorized in the Supplemental Appropriations Act of 1984. It is an iterative testing process to develop improved operational strategies of water deliveries to ENP using the existing features of the water management system. The program will continue through completion of the Modified Water Deliveries to ENP and C-111 Projects. Because the existing system is not adequate to fully restore the hydrology of ENP without causing adverse flood impacts to adjacent private property, the tests have been designed carefully to avoid such impacts. The seventh iteration is now underway.

RESTORATION BENEFITS: The purpose of the program is to provide a mechanism to test alternative water management strategies and evaluate their impacts. Hydrologic and ecologic data are being collected to help determine the relation of water management actions on the flora and fauna. The goal is to restore more natural hydrologic conditions in ENP during the design and construction period of the Modified Water Deliveries to ENP and C-111 Projects. When these projects are constructed, the existing operational constraints will be eliminated. The Experimental Program will recommend an operating strategy for the completed projects. The project is authorized and funding is available through the Modified Water Deliveries to ENP and C-111 Projects.

Time Line and Fiscal Year Budget (in thousands of dollars) for Experimental Program of Modified Water Deliveries to ENP

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
Subtotal																**$0**

TITLE: Nutrient Threshold / Dosing			
SUBREGION : 3	***PROJECT ID:*** CE15	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research	**SFWMD** $ 9,000,000 **Federal** $ 4,000,000 ***TOTAL:*** $13,000,000	
PROJECT PLAN MANAGER: Tom Fontaine (561)687-6551	***BASIS:***	***APPROPRIATED TO DATE:***	
LEAD ORGANIZATION(S): SFWMD,DOI, DEP		**SFWMD** $ 7,000,000 **DOI** $ 3,000,000 **FDEP** 0	
SUPPORTING ORGANIZATION(S):			
COUNTY(S): Palm Beach, Broward, Dade		***REMAINING FINANCIAL REQUIREMENT***	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		**SFWMD** $ 2,000,000 **DOI** $ 1,000,000 ***TOTAL:*** $ 3,000,000	
START: 1994	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: By December 31, 1998 and no later than December 31, 2001 the Department of Environmental Protection and the South Florida Water Management District shall employ all means practicable to complete any additional research necessary to numerically interpret the Class III narrative nutrient criterion for phosphorus, necessary to meet water quality standards in the Everglades Protection Area.

RESTORATION BENEFITS: Expected benefits of setting a numeric phosphorus criterion for the Everglades includes prevention of imbalance of flora and fauna, and long term recovery of phosphorus impacted ecosystems.

Time Line and Fiscal Year Budget (in thousands of dollars) for Nutrient Threshold / Dosing																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
SFWMD, DOI DEP																
Subtotal	2,300	2,100	2,000	2,000	1,000											**$9,400**

TITLE: South Dade Wetlands			
SUBREGION : 3	***PROJECT ID:*** CE17	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: **Land Acquisition**	***BUDGET CATEGORY:*** **Land Acquisition**	SFWMD $17,450,000 Dade Co. $17,450,000	
PROJECT PLAN MANAGER: SFWMD: Rinaldi (561)687-6537 Dade Co: Young (305)375-3614	***BASIS:***	***TOTAL:*** $34,900,000	
LEAD ORGANIZATION(S): SFWMD, Dade County		***APPROPRIATED TO DATE:*** SFWMD $ 5,000,000 Dade Co. $17,450,000 $22,450,000	
SUPPORTING ORGANIZATION(S):			
COUNTY(S): Dade		***REMAINING FINANCIAL REQUIREMENT:*** SFWMD $12,450,000 Dade Co. $ 0 *TOTAL:* $12,450,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**			
START: 1994	***END:*** 2007	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The South Dade Wetlands land acquisition project includes approximately 50,000 acres located primarily in Dade County, with a very small portion on the edge of Monroe County. This project includes approximately 42,000 acres along the eastern side of the Southern Glades Project, as well as a 7,500-acre parcel along the northeastern portion of the SFWMD's Southern Glades Project. These lands form a contiguous habitat corridor with Everglades National Park, the Southern Glades Wildlife Management Area, Biscayne Bay National Park, Crocodile Lake National Wildlife Refuge, Florida Keys National Marine Sanctuary, and John Pennekamp State Park. The project area includes a variety of habitats, both freshwater and estuarine, that are home for many threatened and endangered species, including: Florida panthers, American crocodiles, wood storks, the coast leather fern and the silver palm.

RESTORATION BENEFITS: Acquisition of these land swill preserve critical freshwater wetland and marine wildlife habitat in the project area, including one of the longest strips of undeveloped red mangrove habitat on the east coast of Florida. Public ownership will ensure continued encouragement of sheet flow of high quality freshwater across these wetlands to the estuarine areas of Card Sound, Barnes Sound, and Manatee Bay. The South Dade Wetlands project area is a primary source of overland freshwater flow to Biscayne Bay National Park and the southern portions of Biscayne Bay Aquatic Preserve. This area also functions as an aquifer recharge area, thereby serving to prevent saltwater intrusion. The estuarine wetlands in this project area are critical habitat for the American crocodile.

NOTE: The 7,500-acre parcel is sometimes referred to as the "C-111 North Project" by Dade County and is included as part of the Southern Glades Project in the SFWMD's Save Our Rivers Five-Year Plan. Because of a cooperative cost-sharing agreement between Dade County and the SFWMD that establishes a 50/50 cost-share on the original 42,000 acres of the Model Lands plus this 7,500-acre parcel, they are included together here as the South Dade Wetlands Project.

Time Line and Fiscal Year Budget (in thousands of dollars) for SOUTH DADE WETLANDS																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Land Acq.																
Project																
SFWMD	1,500	2,100	2,100	2,100	2,100	2,100	900									12,450
Subtotal																**$12,450**

TITLE: Six Water Level and Meteorological Monitoring Stations			
SUBREGION : 3	***PROJECT ID:*** CE18	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Monitoring		
PROJECT PLAN MANAGER: Scott Woolam (850) 488-2427	***BASIS:*** 1	***TOTAL:*** $ 1,076,000	
LEAD ORGANIZATION(S): FDEP		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): NOAA, NPS, SFWMD, USGS			
COUNTY(S): Collier, Dade, Monroe		TOTAL: $ 0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** TS41 **Associated with:** TS23		***TOTAL:*** $ 1,076,000	
START: 1998	***END:*** 2003	***APPROVED:*** 11/97	***LAST REVISION***: 2/98

DESCRIPTION: Six water level and meteorological monitoring stations to be located in Florida Bay and Biscayne Bay to measure physical conditions at coastal locations. These stations will collect data on water levels, backup water levels (storm surges), wind speed and direction, rainfall, barometric pressure, air and water temperature, relative humidity, solar radiation, and salinity. Units hardwired to a telephone line will include a speech synthesizer so that data (real time) can be obtained by phone.

RESTORATION BENEFITS: Real-time hydrologic and meteorological data will be readily available for trends analysis and modeling for indicators and variables important for measuring restoration success.

Time Line and Fiscal Year Budget (in thousands of dollars) for Six Water Level and Meteorological Monitoring Stations

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Installations		■														
Operation		■	■													
Operation				■												
Operation					■											
Operation						■										
Project																
State		242.5	70	72.5	75	78	0									538
Federal		242.5	70	72.5	75	78	0									538
Subtotal		485	140	145	150	156	0									**$1,076**

TITLE: C-111 Basin Hydrologic Investigations and Model Development			
SUBREGION : 3	***PROJECT ID:*** CE19	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: **Science**	***BUDGET CATEGORY:*** Natural Resources Management	$2,040,600	
PROJECT PLAN MANAGER: **Graham/Genereux**	***BASIS:*** 2	***TOTAL:*** $2,040,600	
LEAD ORGANIZATION(S): University of Florida, Florida International University		***APPROPRIATED TO DATE:*** $0	
SUPPORTING ORGANIZATION(S): USDA, SFWMD, USACE			
COUNTY(S): Dade		$0	
LINKED PROJECTS: **Dependent on:** TS01 **Critical to:** CE06 **Associated with:** CE10		***REMAINING FINANCIAL REQUIREMENT:*** ***TOTAL:*** $2,040,600	
START: 1998	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Proposed structural and operational changes to the Central and Southern Florida (C&SF) water management system have been evaluated to assess gross changes in regional hydrology, however, the temporal and spatial scale of the current modeling efforts, and the density of the current monitoring system, are inadequate to predict and assess localized flooding in the agricultural area that may result from these changes. The first task of the proposed project consists of evaluation and enhancing the available regional hydrology and water quality data, particularly in the agricultural areas east of C-111. The second task involves developing a model capable of simulating the hydrology in the agricultural area, at a spatial and temporal scale that will allow prediction of localized impacts from proposed structural and operational changes to the water management system. In addition to model development, the phase will involve field experiments necessary to formulate, develop, and calibrate the model. Upon verification and calibration, the model will be useful for evaluating the potential impacts of alternative operational changes to the water management system on the hydrology of the agricultural area. Throughout the project, researchers will interact with the US Army Corps of Engineers (COE), the US Department of the Interior (DOI), the US Department of Agriculture (USDA), and the South Florida Water Management District (SFWMD), to help improve the planning, design, and operation of water management facilities in south Dade County for the benefit of the natural system and agricultural and urban communities.

RESTORATION BENEFITS: This project will produce and enhance understanding of the local hydrology of South Dade County which is essential for the decision making process regarding the structural and operational characteristic of the C-111 system may proceed in a manner which reflects not only the concerns of ENP, but also of the local residents and their economic impact to the region. Scientifically, the proposed work will include the development of a verified, calibrated, state-of-the-art model dynamically linking the surface and subsurface water flow components in a region where both are central to the local hydrology.

Time Line and Fiscal Year Budget (in thousands of dollars) for Hydrologic Investigations and Model Development

Task	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program															
Data Analysis	125	125	125	125											500
Model Devel	350	350	350	350											1400
Liaison	35	35	35	35											140
Subtotal	510	510	510	510											$2,040

TITLE: Restoration of pineland and hardwood hammocks on previously rock plowed land in C-111 Basin in Dade County			
SUBREGION : 3	***PROJECT ID:*** CE21	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Area Management	$600,00 + IFAS MATCH (in kind)	
PROJECT PLAN MANAGER: Don Pybas/R.J. Knight	***BASIS:*** Ecosystem Restoration	***TOTAL:***	
LEAD ORGANIZATION(S): University of Florida/IFAS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): SFWMD, FDACS, FDEP, USDA, USDI			
COUNTY(S): Dade		***TOTAL*** none	
		REMAINING FINANCIAL REQUIREMENT: $600,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** TS07		*TOTAL:* $600,000 = IFAS MATCH (in kind)	
START: 1997	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Restore South Florida slash pine and hardwood hammock species on a 200-foot wide strip on each side of the two miles of SR 9336 from C-111 canal to the L-31W canal, i.e. a total of ca. 50 acres. Two one-acre hammocks each 200' X 216' will be established in low lying areas on each side of the road. Initially each hammock will contain the following native species: A. Trees: dahoon holly, Florida trema, golden fig, gumbo limbo, Krug's holly, live oak, paradise tree, sweet bay and West Indian mahogany, and B. Shrubs: bitter bush, marlberry and Tetrezygia. After the overstory ha become established, several native stoppers, wild coffee and other shade-loving species will be added to form an understory. Monitoring data will be collected to show the progressive reduction in vulnerability to encroachment of exotics as the trees gain stature.

RESTORATION BENEFITS: This project will demonstrate the techniques required to re-establish native conifer and hardwood forests on land that has been rock plowed. This arrangement of pineland and hardwoods will create a most attractive approach to Everglades National Park. Within a few years these native trees and shrubs will attract a succession of native butterflies and other arthropods, and various, and various native grasses, herbs, mushrooms, amphibians, reptiles, birds, and mammals. These biological associations will provide a hospitable environment for various endangered species.

Time Line and Fiscal Year Budget (in thousands of dollars) for Restoration of pineland and hardwood hammocks on previously rock plowed land in C-111 Basin in Dade County																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
IFAS	150	150	100	100	100											600
Subtotal																$600

TITLE: Extension Public Information Support Ecosystem Restoration in C-111 Basin in Dade County			
SUBREGION : 3	***PROJECT ID:*** CE23	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: PIE	***BUDGET CATEGORY:*** PIE		
PROJECT PLAN MANAGER: Don Pytras / J.H. Crane	***BASIS:*** 2, Ecosystem Restoration	***TOTAL:*** $ 754,425 + IFAS Match (in kind)	
LEAD ORGANIZATION(S): Univ. of Fla., IFAS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): SFWMD, FDACS, FDEP, USDA, USACE, USEPA, USDI			
COUNTY(S): Dade		$ 0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $ 754,425 + IFAS Match (in kind)	
START: 1997	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Develop and conduct extension/public information and education programs on water issues including flooding, water table, levels, drought, water use and water quality for the benefit of vegetable, tropical fruit, and ornamental growers and for urban residents. Facilitate effective communication between and among growers, homeowners, the SFWMD, USACE, USDI, FDACS, FDEP, USEPA, USDA and others concerned with water management and water issues. Provide input to University of Florida Hydrology Task Force, the USDA hydrological engineer stationed with the USACE in Jacksonville and the one at the Subtropical Horticulture Research Station in Miami. Make recommendations to agricultural community concerning practices that need to be changed. Assure rapid adoption of BMP's developed by UF/IFAS Crops Research Working Group.

RESTORATION BENEFITS: Assure that agricultural community, SFWMD, USACE, USDI, USDA, etc., address water issues in a highly professional and timely manner. Assure the rapid and extensive adoption of BMP's by production agriculture in Dade County to provide improved water quality and water conservation. Assist growers in coping with the full spectrum of water-related issues. Assure that agriculture (I) is a viable and durable agent in ecosystem restoration, (ii) is an environmentally friendly neighbor to fragile natural ecosystems and (iii) serves as an effective buffer against pollutants from urban areas.

Time Line and Fiscal Year Budget (in thousands of dollars) for Extension Public Information Support Ecosystem Restoration in C-111 Basin in Dade County

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Extension education in C-111 Basin																
Project																
	214	121	123	146	151											755
Subtotal																**$755**

TITLE: Grossman Hammock Restoration			
***SUBREGION :* 3**	***PROJECT ID:*** CE 24	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Management	***BUDGET CATEGORY:*** Land Management	Dade Co. $100,000	
PROJECT PLAN MANAGER: DeVries (305) 242-7800	***BASIS:*** Dade Co. Wetlands Trust Fund	***TOTAL:*** $100,000	
LEAD ORGANIZATION(S)*:* ENP		***APPROPRIATED TO DATE:*** Dade Co. $100,000	
SUPPORTING ORGANIZATION(S): Dade Co.			
COUNTY(S)*:* Dade Co**.**			
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $ 0	
START: 1998	***END:*** 2000	***APPROVED****:* 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project involves the re-vegetation of 3.5 acres of hardwood hammock habitat decimated by the invasion of exotic plant species and Hurricane Andrew. The restoration will be accomplished through the planting of approximately 1,400 native trees and shrubs. The area will be monitored to document the success of the restoration effort and maintained to assure that exotic plant species do not become established.

RESTORATION BENEFITS: Grossman Hammock site is one of the most important biological and archeological resources of the East Everglades region. The restoration will restore the character of the original hammock and adjacent wetland.

Time Line and Fiscal Year Budget (in thousands of dollars) for Grossman Hammock Restoration																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Restoration																
Project																
Dade Co.		90	0	10												100,000
Subtotal																**$100,000**

TITLE: West Dade Water Reuse Reconnaissance Report			
SUBREGION : 3	***PROJECT ID:*** CE25	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: **Infrastructure**	***BUDGET CATEGORY:*** **Infrastructure**	**Corps** $100,000	
PROJECT PLAN MANAGER: Glenn B. Landers 904-232-2125	***BASIS:*** 1	***TOTAL:*** $100,000	
LEAD ORGANIZATION(S): USACOE; MDWSAD		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): DERM; SFWMD; EPA; FDEP;		**Corps** $0	
COUNTY(S): Dade County		**TOTAL** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** CE06, CE10		**Corps** $100,000	
		TOTAL: $100,000	
START: March 1997	***END:*** September 1999	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The study area is located in southern Dade County, with the tentative site location of the facility west of Tamiami Airport in the general area of canal C-1 and the L-31N borrow canal. The Miami-Dade Water and Sewer Authority Department (MDWSAD) is proposing this new regional treatment facility. The new facility would have a treatment capacity of 100 mgd (155cfs) which can be used to improve the water quality and increase the supply of surface water in the Everglades, which could enhance the habitat for fish and wildlife. The proposed plan does not consider discharge directly into Everglades National Park. It would consider raising stages in canal C-1 or create a treatment area to reduce the outflow of groundwater from Everglades National Park. The Corps is coordinating with MDWSAD and other interested agencies - FDEP, DERM, SFWMD, ENP, and EPA, to consider various alternatives for the reuse water that will favorably affect the fish and wildlife habitat. A Reconnaissance Report will be prepared to identify the problem, determine if there might be a feasible solution, determine if there is a Federal interest in participating, and recommend whether further studies should be undertaken. If further studies are recommended, a Project Study Plan will be developed to describe the scope, cost, and schedule for such a feasibility study. The cost of the feasibility study would be shared equally with the Metropolitan Dade County Water and Sewer Authority. If continuation to the feasibility phase of study is recommended, the feasibility studies would be initiated in FY 98.

Time Line and Fiscal Year Budget (in thousands of dollars) for West Dade Water Reuse Reconnaissance Report

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Recon Study																
Project																
Recon Study	100															100
Subtotal																**$100**

TITLE: Exotic Plant Control and Restoration of Degraded Plant Communities in the Southern Glades Wildlife and Environmental Area and Environs			
SUBREGION : 2	***PROJECT ID:*** CE26	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Restoration	Dade County $399,000 GFWFC $ 25,000	
PROJECT PLAN MANAGER: Coughlin (954) 985-4705	***BASIS:*** 1	***TOTAL:*** $424,000	
		APPROPRIATED TO DATE:	
LEAD ORGANIZATION(S): GFWFC		Dade County $399,000 GFWFC $ 25,000 TOTAL $424,000	
SUPPORTING ORGANIZATION(S): Dade County, DERM			
COUNTY(S): Dade			
LINKED PROJECTS: **Dependent on:** : **Critical to:** **Associated with:** CE06		***REMAINING FINANCIAL REQUIREMENT*** ***TOTAL:*** $0	
START: 1998	***END:*** 1998	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Exotic plant stands dominated by Brazilian pepper and Australian pine on approximately 63.5 ha of the Aerojet portion of the Southern Glades Wildlife and Environmental Area (SGWEA) will be removed through both mechanical means and by herbicidal treatment. Following exotic plant removal, native trees and shrubs will be planted in order to enhance the environmental value and natural function of these disturbed sites.

RESTORATION BENEFITS: Invasive exotic pest vegetation is one of the greatest long-term threats to the Everglades Ecosystem. The conversion from exotic species monocultures with little wildlife value into functional plant communities will accrue large benefits to a multitude of native wildlife including two critically endangered species, the Cape Sable Seaside Sparrow and the Florida Panther, as well as state-listed species such as the White-crowned pigeon and Florida Tree Snail. A vast exotic seed source will be eliminated to better ensure the integrity of other upland habitats within the SGWEA and adjacent Everglades National Park.

Time Line and Fiscal Year Budget (in thousands of dollars) for Exotic Plant Control and Restoration of Degraded Plant Communities in the Southern Glades Wildlife and Environmental Area and Environs

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Restoration																
Project																
GFWFC		25														25
Dade Co.		399														399
Subtotal		424														$424

TITLE: Tree Island Restoration in the Everglades Wildlife Management Area			
SUBREGION : 3	***PROJECT ID:*** CE27	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Habitat protection/ Restoration	Dade Co. $507,000 GFWFC $203,000	
PROJECT PLAN MANAGER: Coughlin (954) 985-4705	***BASIS:*** 1	***TOTAL:*** $710,000	
LEAD ORGANIZATION(S): GFWFC		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): Dade County, DERM		Dade Co: $ 50,000 GFWFC: $ 58,000	
COUNTY(S): Dade, Broward		***Total:*** $108,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** CE04		Dade Co. 457,000 GFWFC 145,000 ***TOTAL:*** $602,000	
START: 1997	***END:*** 2003	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The project is designed to restore native plant communities and associated ecological function of flood and fire damaged tree islands in the Everglades Wildlife Management Area (EWMA). Over drainage of the northern portion of the EWMA during the 1970's resulted in severe muck burns and the loss of woody vegetation on tree islands, followed by the invasion of Braziilian pepper. Similarly, unprecedented high water depths and inundation durations in the EWMA during 1994-95 resulted in extensive mortality of trees and shrubs on tree islands, particularly in the southwestern portion of the management area. Brazilian pepper is invading tree islands in the northern portion of the EWMA and will be herbicidally treated followed by the planting of native trees and shrubs. The open central portions of tree islands that were created by the drowning of canopy trees in the southern portion of the EWMA will also be planted with woody species characteristic of islands in this physiographic area.

RESTORATION BENEFITS: Tree islands are a unique and important component of the Everglades landscape mosaic. Although tree islands comprise only 2 to 3 percent of the total landscape area in the EWMA, their existence and health is critical to the survival of a host of plant and animal species that require upland habitat for a portion or all of their life histories. Included are a number of species listed by the state and/or federal government as either endangered or threatened. Invasive exotic vegetation is one of the greatest long-term threats to the Everglades ecosystem. The treatment of Brazilian pepper and subsequent planting of native trees and shrubs on tree islands scattered over an area greater than 538,000 acres in extent will help greatly in the curtailment of exotic seed dispersal into new areas. The plantings in the southwestern portion of the EWMA will expedite the successional process of
re-establishment of native woody plants that may have been disrupted by the prolonged period of inundation, and help prevent exotic invasive species such as Brazilian pepper from becoming established.

Time Line and Fiscal Year Budget (in thousands of dollars) for Tree Island Restoration in the Everglades Wildlife Management Area

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Restoration																
Project																
GFWFC	29	29	29	29	29	29	29									203
Dade Co.		50	91	91	91	91	93									507
Subtotal	29	79	110	110	110	110	112									**$710**

TITLE: Everglades Landscape and Everglades Water Quality Model Development			
SUBREGION : 3	***PROJECT ID:*** CE29	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research	SFWMD $ 5,000,000 Federal	
PROJECT PLAN MANAGER: Tom Fontaine (561)687-6551	***BASIS:***	***TOTAL:*** $ 5,000,000	
LEAD ORGANIZATION(S): SFWMD		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S):		SFWMD $ 2,400,000 DOI $ 0 FDEP 0	
COUNTY(S): Palm Beach, Broward, Dade		***REMAINING FINANCIAL REQUIREMENT***	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		SFWMD $ 2,600,000 DOI $ ***TOTAL:*** $ 2,600,000	
START: 1994	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: By December 31, 1998 and no later than December 31, 2001 the Department of Environmental Protection and the South Florida Water Management District shall complete a research and monitoring program to evaluate the ecological and hydrological needs of the Everglades Protection Area, including minimum flows and levels.

RESTORATION BENEFITS: Expected benefits of developing Everglades Landscape and Water Quality Models include: determination of phosphorus loads to the Everglades Protection Area, based upon Nutrient Threshold / Dosing research, that will not cause or contribute to an imbalance of flora or fauna: prediction of nutrient fate and transport, and effects on landscape vegetation, for various hydrologic options (constructed and operational) suggested by the Restudy team or others; support for ATLSS Models.

Time Line and Fiscal Year Budget (in thousands of dollars) for Everglades Landscape and Everglades Water Quality Model Development

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
SFWMD DEP																
Subtotal	700	600	600	600	600											**$2,400**

TITLE: Everglades Tree Island Research and Monitoring Initiative: Phase I			
SUBREGION *:* 3	***PROJECT ID:*** CE30	***FINANCIAL REQUIREMENT:*** SFWMD $130,351 FGFWFC $ 39,400 ***TOTAL:*** $169,751	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Information		
PROJECT PLAN MANAGER: Fred Sklar 561-686-8800	***BASIS:*** 1, 2	***APPROPRIATED TO DATE:*** SFWMD $64,200 FGFWFC $19,700 TOTAL: $83,900	
LEAD ORGANIZATION(S): SFWMD, FGFWFC			
SUPPORTING ORGANIZATION(S): FWS, NPS, USGS			
COUNTY(S): Palm Beach, Broward, Dade, Collier, Monroe		***REMAINING FINANCIAL REQUIREMENT:*** SFWMD $66,151 FGFWFC $19,700 ***TOTAL:*** $85,851	
LINKED PROJECTS: **Dependent on:** **Critical to:** TS01 **Associated with:**			
START: October 1997	END: July 1999	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: State and federal agencies are conducting research and monitoring on tree islands to evaluate minimum flows and levels, Restudy alternatives, hydropattern restoration, and effective water management. This project would seek to coordinate efforts, structure the relevant questions, standardize data collection, reduce costs, and maximize information for water resource management. This project sheet addresses the first year, which will be devoted to designing a multi-phase research and monitoring plan that will form the basis for a multi agency, adaptive management program for the freshwater and native upland systems of the Everglades in a way that crosses management-authority boundaries. Phase II, refinement and implementation, will be submitted at a later date.

RESTORATION BENEFITS: The benefit would be the development of comparable databases and analyses so that management decisions are based on ecosystem-wide information, as opposed to the historical approach of looking at data on an area-by-area basis. The goal of this interagency project is to quantify the relationships between water management, tree island ecology, and wildlife health and diversity.

Time Line and Fiscal Year Budget (in thousands of dollars) for Everglades Tree Island Research and Monitoring Initiative: Phase I

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Inter. Meeting	■	■	■													
Dev. And Ref of Com. Tech	■	■	■													
Dev. Of Com database		■	■													
Out. Rev of Coop app.		■	■													
Project																
SFWMD		64.2	66.2													130.4
FGFWFC	19.7	19.7														39.4
Subtotal	19.7	83.9	66.2													**$169.8**

TITLE: Inventory of Tree Islands in WCAs 2 and 3			
SUBREGION : 3	***PROJECT ID:*** CE 31	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Information	FGFWFC $338,600 FWS $44,600	
PROJECT PLAN MANAGER: Lorraine Heisler 561-778-5094	***BASIS:*** 1, 2	***TOTAL:*** $ 383,200	
LEAD ORGANIZATION(S): FGFWFC		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): FWS		FGFWFC $63,400 FWS $12,000	
COUNTY(S): Palm Beach, Broward, Dade		***TOTAL:*** $75,400	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** TS01, CE10,CE04 **Associated with:**		FGFWFC $275,200 FWS $32,600 ***TOTAL:*** $307,800	
START: 8/1997	***END:*** 6/2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The aim of this project is to collect information on a characteristic Everglades landscape component that has been largely been ignored in the WCAs yet which is a significant component of the regional ecology. In addition, the sensitivity of the vegetation on these tree islands to inundation and to drought makes them a powerful indicator of the effects of water management practices. The project is composed of two phases. The first, to be completed by June 1998, focuses on inventorying 40 tree islands selected to represent the range of hydrologic conditions that have been recorded over the past 30 years within WCAs 2 and 3. It combines on-the-ground investigations of vegetation composition and structure with a GIS-based landscape-level analysis. The second phase would develop the baseline for long-term monitoring (see below). Related projects by other agencies include topographic mapping of current conditions, bird community studies, dendrochronological studies, re-vegetation projects, palynological investigations, and research into physical processes by which tree islands are formed.

RESTORATION BENEFITS: The information obtained during the year of Phase 1 will be used to evaluate alternative hydrological scenarios considered by the Restudy. The information gathered by both phases would form the basis of a long-term, multi-agency co-ordinated monitoring program (prospective project) aimed at providing input for the adaptive management of water levels within the remnant Everglades system.

Time Line and Fiscal Year Budget (in thousands of dollars) for Inventory of Tree Islands in WCAs 2 and 3

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Phase I																
Data analysis																
Phase II																
Data analysis																
Project																
FGFWFC	63.4	63.4	108.6	108.6	56											400
FWS	12	32.6														44.6
Subtotal	75.4	96	108.6	108.6	56											$444.6

TITLE: Phosphorus Monitoring at Loxahatchee NWR			
SUBREGION : 5	***PROJECT ID:*** CE34	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Monitoring	USFWS $13,000/year ***TOTAL:*** $13,000/year	
PROJECT PLAN MANAGER: Jewell (561)732-3684	***BASIS:***	***APPROPRIATED TO DATE:***	
LEAD ORGANIZATION(S): USFWS		USFWS $78,000 since 1992 ***TOTAL:*** $78,000	
SUPPORTING ORGANIZATION(S): Florida International University			
COUNTY(S): Palm Beach		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** CE15		***TOTAL:*** $13,000/year	
START: 1992	***END:*** Unknown	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Since 1992, Loxahatchee National Wildlife Refuge has been collecting data on total phosphorus levels in the marsh water and atmospheric deposition. The monitoring is required by the Everglades Water Quality Lawsuit. Marsh water concentrations are used to determine compliance with the interim and long-term limits. The atmospheric deposition is used to determine how much phosphorus is contributed to the Everglades system through atmospheric fallout.

RESTORATION BENEFITS: The monitoring contributes to an understanding of the phosphorus cycles in the northern Everglades compared with the southern Everglades. The results will be used as part of a large data pool from multi-agency research and monitoring efforts to determine the phosphorus threshold for the Everglades. Post BMP and STA completion monitoring for marsh water quality will have to continue to determine the success of the restoration efforts.

Time Line and Fiscal Year Budget (in thousands of dollars) for Loxahatchee NWR Phosphorus Monitoring																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Water Quality Monitoring																
Atmospheric Deposition																
Project																
Subtotal																

TITLE: Exotic Plant Control on Loxahatchee National Wildlife Refuge			
SUBREGION : 5	***PROJECT ID:*** CE 35	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Natural Resources Management	USFWS $130,000/year SFWMD $ 75,000/year	
PROJECT PLAN MANAGER: Jewell (561)732-3684	***BASIS:***	***TOTAL:*** $205,000/year	
LEAD ORGANIZATION(S): USFWS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): SFWMD		USFWS $442,500 SFWMD $375,000	
COUNTY(S): Palm Beach		***TOTAL:***$817,500	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***REMAINING FINANCIAL REQUIREMENT:*** ***TOTAL:*** $205,000/year	
START: 1992	***END:*** unknown	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Melaleuca is an exotic tree that affects over 60,000 acres in A.R.M. Loxahatchee National Wildlife Refuge. An intensive eradication program began in 1992, and since then almost 2 million trees have been killed. The trees are still a serious threat to the northern Everglades. Biological controls will take many years to manifest their effects. Until then, it is imperative to control the spread and reduce the existence of the trees in the Everglades. The refuge maintains its own exotic plant control crew that operates year-round.

RESTORATION BENEFITS: Restoration cannot be achieved without the control of exotic plants such as Melaleuca. Because of the biomass involved with the size and quantity of Melaleuca trees, they represent a serious threat to the function of the Everglades ecosystem.

Time Line and Fiscal Year Budget (in thousands of dollars) for Loxahatchee NWR Exotic Plant Control																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
USFWS																
SFWMD																
Project																
USFWS	130	130	130													390
SFWMD	75	75	75													225
Subtotal	205	205	205													**$615**

TITLE: Miccosukee Tribe Water Management Area			
SUBREGION : 5	***PROJECT ID:*** CE36	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Infrastructure		
PROJECT PLAN MANAGER: Duncan (305) 223-8380	***BASIS:*** 1 & 2	***TOTAL:*** $42,113,000	
LEAD ORGANIZATION(S): Miccosukee Tribe		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): USACE, BIA			
COUNTY(S): Broward		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** WCA5-M		***TOTAL:*** $42,113,000	
START: 1997	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The Miccosukee Water Management Area (MWMA) is a project to construct a managed wetland on the Miccosukee Tribe's Alligator Alley Reservation. The purpose of the project is to provide water storage capacity and water quality enhancement for waters which discharge into the Everglades Protection Area.

The project will convert approximately 900 acres of tribally owned cattle pastures into a wetland retention/detention area, which will be designed to filter out harmful nutrients contained in stormwater runoff before the water enters the Everglades Protection Area. (Tribal Water Quality Standards adopted December 19, 1997, dictate a numerical standard of 10 parts per billion for total phosphorous inside the Everglades protection area) Costs include planning, design, engineering, and construction of a managed wetland as well as operation and maintenance for the project.

RESTORATION BENEFITS: The MWMA will significantly contribute to the ability of the Federal government to meet it's trust responsibility to the Tribe, while providing protection for the resources of the Everglades Protection Area. In addition to clean water, tribal cultural and economic benefits will also be obtained.

Time Line and Fiscal Year Budget (in thousands of dollars) for Miccosukee Tribe Water Management Area

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Planning & Design																
Construction																
Operation/Man																
Project																
Operational	1264	1264	4211	4211	4211	4211	537	537	537	537	537	537				19,372
Capital																22,741
Subtotal																**$42,113**

TITLE: Miccosukee Tribe Water Management			
SUBREGION : 3	***PROJECT ID:*** CE37	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Management	$4,200,000 initial investment, plus annual expenses of $2,100,000	
PROJECT PLAN MANAGER: Duncan (305) 223-8380	***BASIS:*** 3	***TOTAL:*** $25,200,000	
LEAD ORGANIZATION(S): Miccosukee Tribe		***APPROPRIATED TO DATE:*** BIA $199,000 (Monitoring)	
SUPPORTING ORGANIZATION(S): USACE, BIA		***TOTAL:*** $199,000	
COUNTY(S): Broward		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** BCB2-I		***TOTAL:*** $25,001,000	
START: 1997	***END:*** ongoing	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project involves a holistic approach to surface-water resources management within the Reservation. It includes field surveying of canals and levees, engineering design, ditch excavation, installation of water control structures, aquatic weed control, and collecting and analyzing water quality samples within the Reservation and the marsh interior of WCA-3A.

RESTORATION BENEFITS: The project will provide improved management of flows and quantity distribution as well as enhanced water quality benefits, both on and off the Reservation.

Time Line and Fiscal Year Budget (in thousands of dollars) for Miccosukee Tribe Water Management

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Regulation	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
Ecosystem Man	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
Integration & Coordination of Plan	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
SW Management	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
WQ Monitoring	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
Enviro Engineer	■	■	■	■												
Aq weed control	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
Mapping	■	■	■	■												
Geo Info System	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
GPS	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
Rights protection	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
Project																
Miccosukee Tribe		2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100	2100		25,200
Subtotal																**$25,200**

TITLE: Subregional characterization of the geological framework of the subsurface coarse sand zone and its influence on Florida Bay and the southern Florida ecosystem			
SUBREGION : 3 & 5	***PROJECT ID:*** CE38	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: **Science**	***BUDGET CATEGORY:*** Research		
PROJECT PLAN MANAGER: Scott (904)488-9380	***BASIS:*** 1 and 3	***TOTAL:*** $300,000	
LEAD ORGANIZATION(S): FDEP(FGS)		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): USGS, SFWMD			
COUNTY(S): Collier, Dade , Monroe		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** TS01, SW21, **Associated with:** TS41		***TOTAL:*** $300,000	
START: 1998	***END:*** 2000	***APPROVED:*** 11/97	***LAST REVISION :*** 2/98

DESCRIPTION: This project is a subset investigation of the larger areal distribution of the siliciclastic (sand, silt and clay) formation that may provide ground water to Florida Bay. This investigation concentrates on the potentially permeable sediments in the proximity of Florida Bay to determine the subregional ground-water flow path and the potential of ground-water contributions to the bay. The approach of the project is to drill approximately seven (7) cores in western Dade, southern Collier and Monroe counties onshore and two (2) cores in Florida Bay through the sand zone to depths of approximately 600 feet on average. If this study reveals that the ground waters from this zone are affecting Florida Bay, a follow-up investigation (BCB26-S) will characterize the regional subsurface sand formation and ground-water system through drilling additional cores and conducting further analyses. The approach proposed herein is a less costly means of determining the potential influence of nutrients from ground water in the sand unit on Florida Bay and the southern Florida ecosystem.

RESTORATION BENEFITS: The data obtained by this investigation is required to more fully understand the Florida Bay and southern Florida ecosystems. The ground-water contribution and its effect on the bay have not been fully considered and are not understood. Proper restoration of the ecosystem requires comprehending the influences affecting the entire ecosystem.

Time Line and Fiscal Year Budget (in thousands of dollars) for Subregional characterization of the geological framework of the subsurface coarse sand zone and its influence on Florida Bay and the southern Florida ecosystem

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Core drilling and analyses																
Project																
State		100	40	10												$150
Federal		100	40	10												$150
Subtotal																**$300**

TITLE: L-28 Modification Project			
SUBREGION : 5	***PROJECT ID:*** CE39	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Infrastructure Investment		
PROJECT PLAN MANAGER: Brooks Hall/Houser	***BASIS:*** 2	***TOTAL:*** $4,750,000	
LEAD ORGANIZATION(S): USACE, SFWMD		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): BCNP			
COUNTY(S): Collier, Monroe, Dade, Broward		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** CE10 **Critical to:** **Associated with:** CE06, SW01		***TOTAL:*** $4,750,000	
START: 1995	***END:*** 2000	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The purpose of the L-28 project is to restore more natural hydrologic conditions in the Big Cypress National Preserve and enhance the overall ecosystem restoration goals for South Florida. To restore hydropatterns within Big Cypress National preserve, modifications to L-28, Tamiami Trail, and Loop Road will be evaluated.

RESTORATION BENEFITS: In 1997, the L-28 Study Feasibility phase will be completed with the evaluation and recommendation of a plan with the following goals:

- Re-establish natural flow characteristics and restore hydrologic conditions in support of improving existing wetland habitat and benefiting historic fish and wildlife resources in Big Cypress National Preserve.
- Improve continuity between habitats.
- Effectively monitor hydrologic and ecological effects of project modifications.
- Provide water quality consistent with ecological needs

Time Line and Fiscal Year Budget (in thousands of dollars) for L-28 Modification Project

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Study																
P&S																
Construction																
Project																
	250	300	1200	3000												4.750
Subtotal																$4,750

TITLE: Nutrient Threshold and Dosing Studies for Everglades National Park and Loxahatchee National Wildlife Refuge			
SUBREGION : 7	***PROJECT ID:*** CE40	***FINANCIAL REQUIREMENT:*** $950,000 per year for the next four years	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Water Quality		
PROJECT PLAN MANAGER: Bob Johnson 305-242-7710	***BASIS:*** 2	***TOTAL:*** $3,800,000	
LEAD ORGANIZATION(S): ENP		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): SFWMD, USFWS, FIU		NPS $1,400,000 USFWS $600,000 SFWMD $1,000,000 FIU In kind services TOTAL: $3,000,000	
COUNTY(S): Dade		***REMAINING FINANCIAL REQUIREMENT:*** $200,000 per year for the next four years	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $800,000	
START: 1997	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Nutrient dosing and transect studies to assist in the development of Class III water quality standards for phosphorus impacts in native plant and animal communities in the Everglades (principally in the Loxahatchee National Wildlife refuge and Everglades National Park). Approximately 50 percent of funds will go to cover budget shortfalls in our ongoing channel dosing experiment, and the rest will go to repeat a nutrient transect study conducted approximately eight years ago.

RESTORATION BENEFITS: This work will assist in establishing the threshold for nutrients in the Everglades so that hydrological restoration can proceed, without causing imbalances in native flora and fauna.

Time Line and Fiscal Year Budget (in thousands of dollars) for Nutrient Threshold and Dosing Studies for Everglades National Park and Loxahatchee National Wildlife Refuge

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Dosing	■	■	■	■												
Transect	■															
Project																
NPS	350	350	350	350												1,400
USFWS	150	150	150	150												600
SFWMD	250	250	250	250												1,000
Subtotal																$3,000

3.5 *SOUTHEAST COAST*
Sub-Region 4

ECOLOGICAL SETTING

The Southeast Coast (SEC) subregion extends about 100 miles from West Palm Beach to Florida City, encompassing the eastern portions of Dade, Broward, and Palm Beach counties, and adjacent coastal waters. The SEC is primarily an urban megalopolis, but it also contains substantial agricultural acreage in central Palm Beach and southern Dade counties. The SEC is transected by a multitude of canals which provide flood protection to support urban development and agriculture. Flood protection is provided by maintaining groundwater levels significantly lower what occurred historically and by diverting storm water through the canal system and discharging it to the estuaries. The Southeast Coast Subregion is bordered on the west by Everglades National Park and the Water Conservation Areas and on the east by Biscayne Bay, Biscayne National Park, Lake Worth Lagoon, and the Atlantic Ocean. The outstanding topographic feature of the SEC is the Atlantic Coastal Ridge, a narrow sand and limestone ridge, 2-10 miles wide, that forms a barrier between the Atlantic Ocean and the Everglades Basin.

The coastal ridge is home to the majority of the region=s 4.5 million human inhabitants, roughly one third of the state=s population. The ridge was historically covered with pines and palmetto, interspersed with hardwood hammocks. Even with intensive urban development, representatives of most natural plant communities characteristic of South Florida still exist, although these are now reduced, fragmented, and stressed. These include barrier island beach and dune, coastal salt and freshwater marsh, maritime hammock, cypress forest, coastal strand, rockland hammock, pine rocklands, and scrub. Some of these communities, as well as many individual plant species within them, are endemic only to South Florida. Dade County probably has more endemic plant taxa (55-65) than any other Florida county. Most of these occur in pine rocklands, which harbor the third largest concentration of endemic native plants in the continental United States.

The SEC is dependent primarily on the shallow Biscayne Aquifer for potable water. This may be the most permeable water-table aquifer in the world. Aquifer recharge is mainly by direct infiltration from rainfall, supplemented by surface from the primary water management canals to supply wellfields and prevent coastal saltwater intrusion.

LINKAGE TO THE TOTAL SYSTEM

The SEC is linked to other Sub-regions principally by water. The Biscayne Aquifer is the major water resource for the SEC. Releases from Lake Okeechobee and the Water Conservation Areas via canals and ground water seepage recharge the Biscayne Aquifer and supplement natural recharge from rainfall to prevent saltwater intrusion along the coast. The water supply needs of Lake Okeechobee and areas connected to it via the St. Lucie Canal and the Caloosahatchee River can be affected by these releases to the SEC. Urban and agricultural water supply needs, drainage for flood protection and the associated storm water runoff impact water inflow to ENP, Florida Bay, and

Biscayne Bay.

Major ecosystem issues in the SEC include: human population growth and conversion of raw land for development, loss of important agricultural lands; water supply for natural systems and human populations; quantity and quality of freshwater flows to estuaries; quality of groundwater and inland surface water; preservation and restoration of natural areas; loss of habitat; invasive non-indigenous species; sea level rise and its long term effects; and lack of common environmental understanding and perspective. Quality of life and economic sustainability issues are also complex in a society that is built upon and dependent on a fragile ecosystem. To be successful, ecosystem restoration efforts must incorporate the needs of the human population.

The sheer size and continuing expansion of the human population, with its demand for land and water, has permanently altered the South Florida ecosystem. The population is culturally diverse and politically is broken into over one hundred municipalities and two hundred special districts over the three county area. There is a varied sense of collective memory and sense of place as the population shifts over time. Each group views the environment with differing values, demands, and commitment. Development of a public vision that includes environmental quality may be the greatest challenge for Everglades restoration.

As development continues to expand from the coastline west, the cumulative impacts to wetlands, aquifer recharge and lowering of the ground water table are more evident. The water table was lowered to provide flood protection to residents and enable expansion of agriculture. By changing the ground and surface water flows, flows from coastal springs and artesian wells were reduced and the amplitude of seasonal fluctuations increased. Storm water discharges have also increased to maintain flood protection while water quality has declined due to storm water runoff from urbanized and developed areas. Demand for ground water is expected to increase and the threat of contamination will as well due to the transmissivity of the Biscayne Aquifer.

Natural tributary drainage and groundwater flows from the Everglades to the coast have been altered by the construction of an extensive system of water management canals. The receiving estuaries have been detrimentally affected by the impact of reduced groundwater flows and sporadic, short-term, extraordinarily high-volume storm water discharges from agricultural and urban areas and excess water from the WCAs.

The great loss of habitat resulting from extensive land development has almost eliminated some vegetative communities from the SEC landscape. The amount of protected natural habitat, now scattered in fragments within the urban/agricultural landscape, is so small that it does not guarantee the future of threatened and endangered species or other native species.

The SEC is the recipient and new home for many non-native plant and animal species due to the warm, wet climate and lack of frost. Their rampant spread has had devastating impacts on native vegetative communities and the general ecological balance. For example, over 300 species of exotic plants are known to be established in natural community fragments in Dade County south of the Miami River.

A key to achieving the long-term protection and restoration of the South Florida ecosystem in the SEC will be the promotion of sustainable agriculture and

urban development practices and patterns. Minimizing the loss of agricultural lands and facilitating sound infill development and revitalization will be important tools for curbing urban sprawl and enhancing the quality of life for South Florida residents. This will redirect some of the anticipated future population growth in the SEC away from lands that will be needed to restore the Everglades ecosystem and still meet the water needs of urban and agricultural users and the natural system.

RESTORATION OBJECTIVES:

The restoration objectives of critical importance for Sub-region 4 have been identified by the Working Group and are listed as follows:

- Promote water conservation.
- Reduce water supply dependence on Lake Okeechobee/WCA water.
- Protect the Biscayne Aquifer and its functions.
- Avoid/reduce expansion of development into wetlands, and ensure protected wildlife habitat.
- Eliminate invasive exotic species.
- Protect the quality of groundwater.
- Reestablish and maintain fishable, swimmable waters.
- Restore or maintain natural biodiversity.
- Promote more sustainable urban development practices and patterns.
- Promote more sustainable agricultural practices including promoting the retention of agricultural and other open space lands.
- Restore estuary water budgets, circulation dynamics, and salinity.
- Preserve upland biological communities.
- Restore seagrass, mangrove, and other estuarine habitats
- Important restoration projects in progress or proposed for the Sub-region are identified on the following pages

TITLE: Homestead Air Reserve Base Realignment and Closure			
SUBREGION : 4	***PROJECT ID:*** SE01	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:***	USDOD/EPA Superfund oversight	
PROJECT PLAN MANAGER: Richard Harvey	***BASIS:***	***TOTAL:***	
LEAD ORGANIZATION(S): USDOD		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): EPA			
COUNTY(S):		***TOTAL:*** $31 million	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:***	
START: 1997	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project is an ARB-NPL site and base realignment and closure (BRAC) fast-track cleanup. The 2,940-acre site is located south of Miami in Dade County. The environmental remediation of the base is pursuant to CERCLA/CERFA acts in implementing the Presidential decision to promote early reuse of military bases undergoing closure by expediting environmental cleanup.

RESTORATION BENEFITS: Cleanup of the base fulfills Superfund objective of promoting human health and environmental protection. Two-thirds of the base will be transferred for community use as a restoration benefit. The cleanup which has high priority from an EPA Superfund perspective would allow economic redevelopment in South Dade County where an estimated 11,000 jobs have been lost as a result of base closure and Hurricane Andrew. Cleanup of the base is ongoing. DOD contact is Tom Bartol (305/224-7233). Cleanup completion of the base transfer property (2/3 of base) is targeted for the end of FY98. Cleanup completion of cantonment area (retained by DOD as Air Reserve Base) is targeted for end of FY01. Some $31 million has been expended to date for cleanup (FY86-1996).

Time Line and Fiscal Year Budget (in thousands of dollars) for Homestead Air Reserve Base Realignment and Closure																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
DOD																
Subtotal																

TITLE: S-26 Salinity Control Structure Repair			
SUBREGION : 4	***PROJECT ID:*** SE02	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Infrastructure Investment	USACE:	
PROJECT PLAN MANAGER: Landers 904-232-2125	***BASIS:*** 3	***TOTAL:*** $526,000	
LEAD ORGANIZATION(S): USACE		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): SFWMD			
COUNTY(S): Dade		***TOTAL:*** $123,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***REMAINING FINANCIAL REQUIREMENT:*** ***TOTAL:*** $403,000	
START: 1998	***END:*** 2000	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: S-26 is a salinity control structure on the Miami canal. The structure discharges flood control flows when necessary and at other times remains closed to hold a freshwater head and prevent salt water intrusion. When the structure was constructed, the upstream/downstream water level differential was underestimated. As a result, discharges through the structure have had higher velocities than were anticipated in the original design. This has caused erosion downstream of the structure that, if left uncorrected, could jeopardize the stability of the structure. The project consists of repairing the down stream scour holes and installing energy dissipation features to prevent further erosion.

RESTORATION BENEFITS: If S-26 were to experience partial or total failure, saltwater could intrude up the canal and contaminate adjacent ground water. Depending on the severity of the failure, urban water supply wellfields could be contaminated and freshwater marshes could be impacted. Additionally, failure of the structure could result in uncontrolled discharge of fresh water into Biscayne Bay. The project can be implemented with existing authority. Detailed design is complete. Plans and specifications will be initiated in FY98. Construction could be initiated and completed in FY99.

TITLE: Stormwater Treatment Area 1 East			
SUBREGION : 4	***PROJECT ID:*** SE03	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	Federal: $46,682,146	
PROJECT PLAN MANAGER: C. Rinaldi (561) 687-6537	***BASIS:*** 1,2	***TOTAL:*** $46,682,146	
LEAD ORGANIZATION(S): USACE, SFWMD		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): USDOI			
COUNTY(S): Palm Beach		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** GL33 **Associated with:**		Federal: $46,682,146	
		TOTAL: $46,682,146	
START: 1995	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project involves acquisition of approximately 6,500 acres located adjacent to the northeast boundary of the A. R. Marshall Loxahatchee National Wildlife Refuge, south of the C-51 canal in central Palm Beach County. The footprint reflects the combination of a 1,438 acre detention area for the C-51 West End Flood Control Project and an additional 5,063 acre stormwater treatment area (STA). This is consistent with the mediated technical plan developed for Everglades restoration in 1993 by the USACE, SFWMD, DOI, and other stakeholders.

RESTORATION BENEFITS: These lands are needed to implement the restoration plan identified in the proposed modifications to the 1992 Federal Consent Decree and the 1994 Everglades Forever Act. Restoration benefits include: (1) capture, storage, and clean-up of approximately 100,000 acre feet per year of excess stormwater currently lost to tide; (2) reduction in damaging freshwater discharges to the Lake Worth estuary; and (3) protection and conservation of wetlands and habitat values outside the Everglades.

NOTE: The C-51 West End Flood Control Project is currently an authorized project, with the SFWMD responsible for 12.8 percent of construction costs, and 100 percent for land acquisition (and relocation) of the 1,438 acre detention area. The federal government is responsible for the remainder of the project costs. The 1994 Everglades Forever Act establishes a deadline for land acquisition of July 1, 1998, which coincides with the initial construction contract activity for the STA 1-East project.

Time Line and Fiscal Year Budget (in millions of dollars) for Stormwater Treatment Area 1 East							
Task	1998	1999	2000	2001	2002	Unprog	Total
Land Acquisition	46.6	0.1	--	--	--	--	46.7
Project							
Subtotal							

TITLE: Barnacle Addition			
SUBREGION : 4	***PROJECT ID:*** SE04	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	Local State	
PROJECT PLAN MANAGER: Outland (904) 488-4892	***BASIS:*** 1, and 3	***TOTAL:*** $3,464,000	
LEAD ORGANIZATION(S): FDEP		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): Dade County			
COUNTY(S):		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		Local State ***TOTAL:*** $3,464,000	
START: 1997	***END:*** Currently in litigation	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project consists of approximately 7 acres in the Coconut Grove Section of Miami ; the primary significance of this project is its association with the Barnacle Historic Site.

RESTORATION BENEFITS: The property supports a 2.5 acre tropical hardwood hammock. Although the understory of the hammock is disturbed, the site does contain several rare plant species, including thatch palm and silver palm. The property includes 240 feet on Biscayne Bay, a State Aquatic Preserve. The site will have a designated use as “historic.”

TITLE: East Coast Buffer/Water Preserve Areas			
SUBREGION : 4	***PROJECT ID:*** SE05	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition		
PROJECT PLAN MANAGER: Jackson (561)687-6334	***BASIS:*** 2	***TOTAL:*** $314,400,000	
LEAD ORGANIZATION(S): SFWMD, DOI		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): USACE		DOI $40,000,000	
COUNTY(S): Palm Beach, Broward, Dade		SFWMD $40,000,000	
		TOTAL: $80,000,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** TS01		***REMAINING FINANCIAL REQUIREMENT:*** ***TOTAL:*** $234,000,000	
START: 1994	***END:*** 1999	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The East Coast Buffer/Water Preserve Areas project involves acquisition of land parcels located along the eastern side of the Everglades Protection Area in western Palm Beach, Broward, and Dade Counties. Most of the lands in this project area are undeveloped, including a considerable amount of wetland habitat. Current land uses include very low intensity development, pasture land, and limestone mining. The original East Coast Buffer footprint was based on a land suitability analysis which selected lands primarily on the basis of those needed for controlling seepage from the Everglades. Since the original analysis, it has been determined that there are additional water storage and water quality treatment (e.g., S-9) requirements that will require more land. Some specific land parcels have already been identified; the precise acreage and locations for additional parcels needed for water storage and water quality treatment are being identified under the C&SF Project Comprehensive Review Study: Comprehensive Plan, Water Preserve Areas, and L-28 Feasibility Study. Parcels already targeted for acquisition include: (1) remaining P2000 lands (12,650 acres); (2) remaining lands within the Pennsuco wetlands (1,967 acres); and (3) the buffer/flow-way in the western 8.5 Square Mile Area (1,065 acres).

RESTORATION BENEFITS: These lands are needed to implement the Everglades restoration plans being developed under the C&SF Project Comprehensive Review Study: Comprehensive Plan, Water Preserve Areas, and L-28 Feasibility Study. The ECB/WPA will consist of a series of surface-water areas that are interconnected and managed as a system of marshlands, reservoirs, water quality treatment areas, and/or aquifer recharge basins. The overall purposes of the project are to: (1) hold more water in the system by controlling seepage from the Everglades; (2) capture, store, and clean up excess stormwater currently lost to tide; (3) provide a buffer between the urban area and the Everglades; and (4) protect and conserve wetlands and habitat values outside the remaining Everglades. Restoration benefits include: improved water supply for restoring hydropatterns of the Everglades; improved water quality; and preservation of wetland habitat.

NOTE: *Because of the extreme development pressure in this area, it is critical that this project be completed as quickly as possible before target parcels are developed or permitted for development.*

TITLE: South Biscayne Bay Watershed Management Plan			
SUBREGION : 4	***PROJECT ID:*** SE06	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:***		
PROJECT PLAN MANAGER: Lee Rawlinson (305)375-2557	***BASIS:***	***TOTAL:*** $3.4 Million	
		APPROPRIATED TO DATE:	
LEAD ORGANIZATION(S): Dade County			
SUPPORTING ORGANIZATION(S): SFWMD, Biscayne Natl Park		***TOTAL:*** $1.7 Million	
COUNTY(S): Dade		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** SE28, SE29 **Critical to:** **Associated with:** SE01, CE17, SE17, SE11, SE18		***TOTAL:*** $1.7 Million	
START: 1998	***END:*** 2000	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The project involves preparing an integrated land use and water management plan for the South Biscayne Bay Watershed. This plan will direct the comprehensive management of land use, surface and ground water including its quality, quantity, timing and distribution; and will insure the restoration and sustainability of the environment, viable agriculture, flood protection and assist in the protection of the potable drinking water supply. The identification and establishment of land uses essential to sustaining Biscayne National Park, while protecting the constitutional private property rights of landowners is a primary objective of this plan.

RESTORATION BENEFITS: Dade County has in the past, and continues to have presently, a very high rate of population growth. The growing demands of the lower east coast of Florida are straining the water resources of the area at a time when the need for ecological restoration is approaching a critical point. The designation of a long-term land use plan for the basins in the study area predicated on a water management plan which insures protection of the downstream waterbodies, Biscayne Bay and Biscayne National Park, is critical. This comprehensive approach to address water quantity, water quality, flood protection, private property rights and agricultural production, is essential in achieving a restored, sustainable, natural system for the critical area.

Time Line and Fiscal Year Budget (in thousands of dollars) for South Biscayne Bay Watershed Mgmt Plan

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Project																
DERM		188	461	591												1240
State of FL		283	175													458
															1717	1717
Subtotal		471	636	591												**$3,415**

TITLE: Freshwater Lake Belts EIS			
SUBREGION : 4	***PROJECT ID:*** SE07	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY:	***BUDGET CATEGORY:***	Federal - 100 percent	
Management	Management	Funding included in Comp Restudy TS01	
PROJECT PLAN MANAGER:	***BASIS:***	***TOTAL:***	
Barron, 904-232-2203	3	***APPROPRIATED TO DATE:***	
LEAD ORGANIZATION(S): USACE			
SUPPORTING ORGANIZATION(S): EPA, SFWMD			
COUNTY(S):		***TOTAL:***	
Dade		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** TS1I, SE05, CE10			
Critical to:			
Associated with:		***TOTAL:***	
START: 1996	***END:*** 1997	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: A coalition of Florida rock mining companies have proposed a concept of mining and mitigation which could impact approximately 54,000 acres of wetlands in northwest Dade County by the year 2050. The lake- belt concept envisions a coordinated plan of large lakes which will provide opportunities for public purposes such as fishing, water sports, municipal water supply, wildlife enhancement and wetland mitigation. The proposed site is within the area being considered for the East Coast Buffer/Water Preserve Area. The plan would replace the existing wetlands with a mix of large deep lakes surrounded by man-made shallow littoral wetlands. The Corps of Engineers is cooperating with EPA and the northwest Dade County Freshwater Lake Plan Committee in the preparation of an Environmental Impact Statement.

RESTORATION BENEFITS: The purpose of the plan is to enhance water supply for Dade County and the Everglades and maximize efficient recovery of limestone while promoting the social and economic welfare of the community and protecting the environment. This project is funded through the Corps of Engineers regulatory program and no additional funding is required.

Time Line and Fiscal Year Budget (in thousands of dollars) for Freshwater Lake Belts EIS																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Planning																
Project																
Subtotal																

TITLE: Establishing BMPs for Agricultural and Urban Areas of the Eastern C-111 Basin			
SUBREGION : 4	***PROJECT ID:*** SE10	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research		
PROJECT PLAN MANAGER: Klassen (305)-246-7038	***BASIS:*** 1	***TOTAL:*** $17,690,000	
LEAD ORGANIZATION(S): University of Florida/IFAS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): SFWMD, FDACS, FDEP, USDA,USACE, USEPA, USDI			
COUNTY(S): Dade		***TOTAL:*** $0	
LINKED PROJECTS: **Dependent on:** **Critical to:** CE06, CE10 **Associated with:**		***TOTAL:*** $17,690,000	
START: 1997	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The overall goal is to improve and enhance agriculture as a valuable and durable agent in ecosystem restoration. University of Florida/ IFAS personnel, in cooperation with the South Florida Water Management District, the Florida Department of Agriculture and Consumer Services, the Florida Department of Environmental Protection, the US Environmental Protection Agency, and the US Department of Agriculture (ARS, CSREES, ERS and NRCS), will develop and extend best management practices (BMPs) to fruit, vegetable, landscape and ornamental growers and urban homeowners in the eastern C-111 Basin. The development, utilization and extensive adoption of the latest technologies to (1) minimize ground and surface water pollution, (2) greatly advance water use efficiency, (3) manage plant diseases, insects and weeds largely by means of biologically-based technologies, and (4) to reduce the vulnerability of crops to persistently high water tables in the C-111 Basin are the strategic objectives of the Project. This Project is essential to facilitate technical assistance need to assure the widespread adoption of thoroughly researched and highly effective BMPs in the C-111 Basin. These BMPs will protect the Biscayne aquifer and prevent the introduction of toxicants and undesirable levels of nutrients into fragile marine and terrestrial ecosystems.

RESTORATION BENEFITS: At the end of the project, a comprehensive strategy together with commensurate technology will exist for a healthy agriculture that contributes to the restoration and maintenance fragile ecosystems within the C-111 Basin and in the adjacent marine areas. The project incorporates economics and works closely with extension in order to facilitate rapid adoption of the necessary technologies through team work involving researchers, extension workers, growers and homeowners throughout every phase of the project.

Time Line and Fiscal Year Budget (in thousands of dollars) for Establishing BMPs for Agricultural and Urban Areas of the Eastern C-111 Basin

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unpro	Total
Project																
#1	214	210	285	295	307											1,311
#2	818	554	582	559	587											3,099
#3	742	438	451	465	479											2,575
#4	1583	1003	1053	1106	1165											5,905
#5	1480	834	856	881	750											4,800
Subtotal																**17,690**

Task #1: Project management, economic research and GIS database.
Task #2: Development of flood- and disease-tolerant fruit, vegetable and ornamental crops.
Task #3: Raised-bed culture of tropical fruit, vegetable and ornamental crops.
Task #4 Biologically-based IPM for crops and exclusion of exotic plants from fallow ground.
Task #5 Control of point source pollution of water, water use requirements of crops, fertilizer leaching, and calibrated soil tests.

TITLE: Hillsboro Demonstration ASR Project			
SUBREGION : 4	***PROJECT ID:*** SE14	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Infrastructure Investment	USACE : SFWMD:	
PROJECT PLAN MANAGER: (Suggested Devillon)561 687-6383	***BASIS:*** 2 Ecosystem Restoration	***TOTAL:*** $6,000,000	
LEAD ORGANIZATION(S): SFWMD, USACE		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): Local Governments			
COUNTY(S): Palm Beach, Broward		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		SFWMD: USACE: ***TOTAL:*** $6,000,000	
START: 1997	***END:*** 1999	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project will implement of a regional Aquifer Storage and Recovery (ASR) demonstration project in the Hillsboro canal region to capture and store excess flows that are currently released to tide for use during dry periods. It is anticipated that operation of the system would reduce discharge to the coastal water-bodies resulting in additional storage within the regional system. Recovery of the stored ASR water will be utilized to recharge local utility wellfields helping to prevent further inland migration of the saline interface. Historically, water is brought into the Hillsboro Canal basin to supply local urban users from the Water Conservation Areas and Lake Okeechobee. Area users include the Lake Worth Drainage District, the City of Boca Raton and Broward County. The demonstration project would consist of four 5 MGD Floridan Aquifer System wells and at least eight 2.5 MGD Surficial aquifer wells. Water will be withdrawn from the surficial aquifer and injected into the Floridan Aquifer System for later retrieval. It is anticipated that extensive discussions with EPA and DEP will be required.

It is projected that water supply deliveries will increase to approximately 130,000 AF/yr for Lower East Coast Service Area Number 1. Full scale implementation of this option should provide approximately 60,000 AF/yr of this demand allowing the 60,000 AF/yr to be utilized to help meet restoration goals. This project represents the initial demonstration and testing phase.

RESTORATION BENEFITS: By creating additional storage in the region, less water will be required from the regional system to the urban areas which could then be used to meet restoration needs. This project will provide information needed to design and implement larger scale ASR projects that will address the future water resource needs of the Lower East Coast.

Time Line and Fiscal Year Budget (in thousands of dollars) for Hillsboro ASR Pilot Project																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Permitting																
Construction																
Testing																
Project																
USACE																
SFWMD																
Subtotal																$6,000

TITLE: North Fork of the New River Restoration				
SUBREGION : 4	***PROJECT ID:*** SE15	***FINANCIAL REQUIREMENT:***		
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Water Qual, Habit Pro, Infra Inv			
PROJECT PLAN MANAGER: Jennifer Schaufele 954-519-1253	***BASIS:*** 2	***TOTAL:***	$570,000	
LEAD ORGANIZATION(S): Broward County		***APPROPRIATED TO DATE:***		
SUPPORTING ORGANIZATION(S): FDCA, FDEP, City of Fort Lauderdale		DEP:	$50,000	for Phase I
		DEP:	$100,000	for Phase 2
		FIND Grant	$37,000	for Dredging
		DCA	$50,000	
COUNTY(S): Broward		***TOTAL:***	$237,000	
		REMAINING FINANCIAL REQUIREMENT:		
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** SE20		***TOTAL:***	$383,000	
START: 1997	***END:*** 1999	***APPROVED:*** 11/97		***LAST REVISION:*** 2/98

DESCRIPTION: The North Fork of the New River, in the City of Fort Lauderdale, is the only remaining section of the New River left in its natural state. Contamination from nearby septic tanks and sewage lines has degraded water quality, habitat and the health and economy of adjacent low-income minority communities. Plans to restore the North Fork include: spot dredging and improvement of water circulation, re-vegetation with native species, identification of contaminants and promoting urban infill development consistent with the Eastward Ho! initiative.

RESTORATION BENEFITS: The water quality of the North Fork has deteriorated such that many water quality indicators do not meet those established by the Florida Department of Environmental Protection. The goal of the restoration effort is to 1) improve the water quality, 2) enhance the biological diversity, and 3) create a more pristine condition. Together these initiatives will restore and improve the health of the North Fork and its surrounding communities.

Time Line and Fiscal Year Budget (in thousands of dollars) for North Fork of New River Restoration

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Restoration																
Project																
Dredging		25	25	350												400
Water Flows	10	10														20
Revegetation	25															25
Analytical Tools	25															25
Plan Develop		40	60													100
Subtotal	60	75	85	350												$570

TITLE: L-31E Flow Redistribution Project			
SUBREGION : 4	***PROJECT ID:*** SE17	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Water Qual, Habit Pro, Infra Inv	USACE $1,400,000 SFWMD $1,400,000	
PROJECT PLAN MANAGER: Rick Alleman 561-687-6716	***BASIS:***	***TOTAL:*** $2,800,000	
LEAD ORGANIZATION(S): SFWMD, USACE		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): FDEP, NPS, DERM			
COUNTY(S): Dade		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** TS1I, SE06, SE29, SE28		***TOTAL:*** $2,800,000	
START: 1997	***END:*** end	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The L-31E Flow Redistribution Project will restore a more natural delivery of surface waters into south Biscayne Bay. During an initial phase, a pilot project diverted fresh water via a spreader canal constructed at the current site of the L-31E levee between Goulds canal on the north to the Florida City canal on the south end. The pilot project has been on going through monitoring. Once the monitoring from the pilot project is complete, the project would continue with the construction of spreader canals along the full extent of L-31E. The design and surveying will be completed with in-house personnel and construction cost are estimated at $400,000 a mile for the length of the levee.

RESTORATION BENEFITS: The L-31E Flow Redistribution Project will restore the ecological integrity of Biscayne Bay by re-establishing the sheet flow of freshwater through coastal wetlands in Biscayne National Park. The project achieves two major objectives by filtering water through coastal wetlands before it reaches the bay, both of which are beneficial to Biscayne Bay, water quality improvement in the timing and distribution of freshwater into the bay.

Surface waters are currently discharged directly into Biscayne Bay through coastal, water management control structure as point discharges. Impacts from a large amount of freshwater going into the Bay at one point in time and place can be seen at the canal mouths. The seagrass community has changed to where more freshwater tolerate species are prevalent at the mouth of canals, and there have been fish kills documented that are attributable to “freshwater poisoning” or “shock” due to too much freshwater at one time.

Other potential benefits include: restoration critical fish and mangrove fringe habitat necessary to increase biological diversity in the Bay; and improved water quality. The most significant benefit is the elimination of point discharges of freshwater into Biscayne Bay.

Time Line and Fiscal Year Budget (in thousands of dollars) for L-31E Flow Redistribution Project																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Monitoring	■	■	■	■												
Construction					■	■	■									
Project																
Subtotal																

TITLE: Lake Worth Lagoon Restoration

SUBREGION : 4	***PROJECT ID:*** SE19	***FINANCIAL REQUIREMENT:*** (Proposed) Palm Beach County $500,000 USACE $1,500,000 ***TOTAL:*** $2,000,000
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Water Quality/Habitat Protection	
PROJECT PLAN MANAGER: J. Barry (561) 233-2400	***BASIS:*** 2	***APPROPRIATED TO DATE:***
LEAD ORGANIZATION(S): Palm Beach County Department of Environmental Resources Management		
SUPPORTING ORGANIZATION(S): SFWMD		
COUNTY(S): Palm Beach		***TOTAL:*** $0
		REMAINING FINANCIAL REQUIREMENT: Palm Beach County $500,000 USACE $1,500,000 ***TOTAL:*** $2,000,000
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		
START: 1997	***END:*** 2000	***APPROVED:*** 11/97 ***LAST REVISION:*** 2/98

DESCRIPTION: This proposal will be broken into three phases of work. Phase 1 will examine both quantity and quality of bottom sediment accumulations both within the C-51 canal and downstream discharge area within the Lake Worth Lagoon. Phase 2 will develop a plan and project design to provide for sediment removal/capping that could include creating a series of sediment traps along the C-51 where sediment accumulations potentially increase. Phase 3 will involve the removal of bottom sediments within the C-51 canal as well as implementing a prototype project to either remove or cap the organic bottom layer within the lagoon. Palm Beach County has been actively involved in managing the Lake Worth Lagoon since 1989. Subsequent to a 1990 study, a 2.5 mile area located within the region of the C-51 canal discharge was found to be severely blanketed by accumulated organic material. This mucky sediment was found to be up to several feet thick creating unnatural, anaerobic substrate devoid of invertebrate life and marine grasses. This has resulted in a loss of fisheries and wildlife habitat and a continued suppression decline of commercial and recreational fish species found within the lagoon. The elimination of the organically enriched sediment from the C-51 Canal discharge will provide for long term improvements to the lagoon and ensure success for enhancement projects currently planned by the county.

RESTORATION BENEFITS: This project will provide immediate benefits in the elimination of the organically-enriched sediments that have accumulated within a 2.5 mile area of the lagoon as well as significantly reducing the flocculent sediments within the C-51 canal that currently flow into the lagoon after rain events. This elimination of polluted sediments will improve water quality and allow for the re-establishment of sea grasses and benthic invertebrate communities. Johnson's sea grass (*Halophila johnsonni*), currently on a list of proposed threatened species, is very common to the Lake Worth Lagoon and would likely re-establish with improvements to water quality. The overall increase in habitat will provide an additional source of food and shelter for many of the estuarine/marine fish species as well as critical habitat for many endangered species of birds and other wildlife.

Time Line and Fiscal Year Budget (in thousands of dollars) for Lake Worth Lagoon Restoration

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Feasibility Study	■	■														
Plans & Designs			■													
Construction				■												
Project																
Palm Beach	100	100	300	0												500
USACE	0	0	0	1500												1,500
Subtotal																**$2,000**

TITLE: Eastward Ho! Corridor Rival Development Trends Fiscal Impact Analysis			
SUBREGION : 4	***PROJECT ID:*** SE20	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Research, Information Management and Assessment	***TOTAL:*** $150,000	
PROJECT PLAN MANAGER: Phyllis Mofson, (850) 922-1608	***BASIS:*** 2	***APPROPRIATED TO DATE:***	
LEAD ORGANIZATION(S): FDCA			
SUPPORTING ORGANIZATION(S): USEPA		***TOTAL:*** $150,000	
COUNTY(S): Dade, Broward, Palm Beach, Martin, St. Lucie		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $0	
START: 1997	***END:*** 1998	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The purpose of this study is to compare the costs of *trend* (status quo) development patterns to *plan* development patterns (infill development and redevelopment of consistent with the Eastward Ho! initiative) in southeastern Florida's urban areas. The results of the study will be used to evaluate and fine tune Eastward Ho! development objectives and -- if the numbers favor plan development -- to educate and build public and local government support of the Eastward Ho! Initiative.

RESTORATION BENEFITS: As part of a comprehensive effort to restore, preserve and protect the South Florida ecosystem, the Governor's Commission for a Sustainable South Florida recommended in it's October 1995 initial report the implementation of an urban redevelopment initiative known as Eastward Ho!. In an effort to slow the westward spread of suburban sprawl from Southeast Florida into the Everglades ecosystem, Eastward Ho! aims to spur infill development and redevelopment in a largely urban 150-mile corridor spanning much of the eastern portions of Dade, Broward and Palm Beach counties. Everglades Restoration will require the slowing or reversal of this western development trend, and successful implementation of Eastward Ho! depends on a clear understanding of its benefits among corridor local governments, residents and potential developers.

Time Line and Fiscal Year Budget (in thousands of dollars) for Eastward Ho! Corridor Rival Development Trends Fiscal Impact Analysis

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
EPA	75	75														$150
Subtotal																**$150**

TITLE: East Coast Canal Structures: C-4 and C-6			
SUBREGION : 4	***PROJECT ID:*** SE21	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Infrastructure Investment	A. $2,500,000 B. $1,250,000	
PROJECT PLAN MANAGER:	***BASIS:***	(Funding for this project may be through joint cost-sharing between SFWMD, ENP, USACE, and the Lake Belt Authority)	
Jorge Marban 561/687-6501 Paul Larson 305/358-0361	2	***TOTAL:*** $3,750,000	
LEAD ORGANIZATION(S): SFWMD, USACE		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): ENP			
COUNTY(S): Dade		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** TS01		***TOTAL:*** $3,750,000	
START: 1997	***END:*** 1999	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project, comprised of two project elements, will involve the construction of water control structures on the C-4 (Tamiami Canal) and C-6 (Miami Canal) to help reduce seepage losses from the Everglades. Project A: This project calls for the construction of gated water control structure(s) in the western reach of the Tamiami Canal. Such structure(s) will increase water levels in the southern end of the Pennsuco wetlands and thereby reduce seepage out of WCA-3B. This project will increase the efficiency of the proposed Water Preserve Area concept, while providing immediate benefit to Everglades National Park and the Pennsuco wetlands. Project B. This project calls for construction of a gated control structure in the Miami Canal and should help to increase water levels in the northern Pennsuco wetlands and reduce seepage losses from WCA-3B and improve hydropatterns in WCA-3B and the Pennsuco wetlands.

RESTORATION BENEFITS: The proposed structures have the potential to maintain higher water levels in the area west of the Dade-Broward levee. Previous modeling of the C-4 structure(s) showed increased overland flows to Everglades National Park by approximately 90,000 af/year, on average, resulting in a 15 percent improvement in hydropatterns in the Park. Hydropatterns also improved in WCA-3B and the Pennsuco wetlands. Seepage losses also were reduced from the eastern edge of Everglades National Park. The C-4 structure(s) helped increase ground water elevations in the vicinity of Miami Dade Water and Sewer Authorities western and Northwestern wellfields while improving the South Florida Water Management District's ability to meet minimum flows and levels for the Biscayne aquifer in central-eastern Dade County. Similiar effects are predicted for the C-6 structure. The exact location of the C-4 and C-6 structures would be evaluated through engineering & design studies and the NEPA process.

Time Line and Fiscal Year Budget (in thousands of dollars) for East Coast Canal Structures: C-4 and C-6

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
A	[redacted]															
B	[redacted]															
Project																
A	75	1212	1212													2500
B	37	606	606													1250
Subtotal																**$3,750**

TITLE: Dade County Archipelago			
SUBREGION : 4	***PROJECT ID:*** SE26	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	Local State	
PROJECT PLAN MANAGER: John Outland (904) 488-4892	***BASIS:*** 1, and 3	***TOTAL:*** $42 ,500,000 (estimated)	
LEAD ORGANIZATION(S): FDEP, Dade County		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S):		Local $27,217,903 State $3,256,422	
COUNTY(S): Dade		***TOTAL:*** $30,474,325	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***REMAINING FINANCIAL REQUIREMENT:*** Local State ***TOTAL:*** $12,025,675	
START: 1997	***END:*** 1999	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project includes 1023 acres in Dade County and contains some of the most outstanding examples of rockland hammock that remain in Dade County, as well as the best remaining examples of the highly endangered pine rockland natural community outside of Everglades National Park. The Miami Rockridge Pinelands sites located within the County's urban development boundary are considered upland and developable. All sites are zoned residential, agricultural, or general use. The trees and endemics are also sensitive to adjacent development and agricultural activities.

RESTORATION BENEFITS: The subtropical pinelands occur exclusively on the Miami Ridge and have been dramatically reduced in acreage by urbanization. Numerous rare and endangered plant species and several animal species, many of which occur nowhere else, occur within the project area. The lands will be used as a botanical site to preserve the unique and endangered plant communities.

Currently on CARL list; Dade County is acquiring the land as part of a 50-50-bargain share agreement with CARL. 464 acres have been acquired at a cost of $30.5 million; about 514 acres remain with an estimated value of $12 million.

TITLE: South Dade Wetlands Addition			
SUBREGION : 4	***PROJECT ID:*** SE27	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition, Water Quality & Habitat Protection	***TOTAL:*** $35,000,000	
PROJECT PLAN MANAGER: Frost (305) 230-1144	***BASIS: 3***	***APPROPRIATED TO DATE:***	
LEAD ORGANIZATION(S): NPS			
SUPPORTING ORGANIZATION(S): Friends of the Everglades, DERM		***TOTAL:*** $0	
COUNTY(S): Dade		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to:** SE06, SE28 **Associated with:** SE01		***TOTAL:*** $35,000,000	
START: 1997	***END:*** TBD	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This acquisition involves purchase of development rights, easements, and fee title in the South Dade Wetlands Addition, approximately 7,000 acres in south Dade County immediately north of the of the South Dade Wetlands and west of the coastal wetlands of Biscayne National Park. The Addition encompasses all or part of Sections 28, 29, 32, and 33 in Township 56, Range 40 East; Sections 4, 5, 7, 8, 9, 17,18,19, and 20 in Township 57 South, Range 40 East. Ownership is mixed public and private. The addition is composed of native forested wetlands, sawgrass glades, prairies, and cattail marsh as well as exotics-dominated wetlands, agricultural land, rock mines, and undeveloped open space.

The acquisition will be a combined federal and county effort. It encompasses some tracts designed for purchase by Dade County's Endangered Environmental lands (EEL) program and complements the work of the county's Biscayne National Park Land Trust Working Group. Portions of the wetlands are already owned by the county or The Nature Conservancy.

RESTORATION BENEFITS: This acquisition will facilitate and expand protection of the South Dade Wetlands and will re-connect fragmented wetlands and open spaces that are essential to the hydrology of Biscayne Bay. It will help buffer coastal and freshwater wetlands from the impacts of rapid urban development occurring in South Dade. This large, contiguous area will contribute to restoring the quality, timing, and distribution of surface and ground water deliveries into the coastal waters. In addition, several threatened or endangered plants and animals are present in this part of Dade County and their protection will be improved by the acquisition. They include the snail kite, Peregrine Falcon, American crocodile, cape sable sparrow, woodstork and bald eagle.

NOTE: Estimated costs of acquisition range from $4,000 to $10,000 per acre. At an average cost of $7,000 per acre the estimated acquisition cost is $21,000,000. This total includes future acquisitions by the county, depending on the availability of funds.

TITLE: Biscayne Bay Feasibility Study			
SUBREGION : 4	***PROJECT ID:*** SE28	***FINANCIAL REQUIREMENT:*** Federal, Dade County, SFWMD/Phase I	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Area Management	Phase I - $1,100,000 Phase II - $1,040,000	
PROJECT PLAN MANAGER: Kim Brooks-Hall (904) 232-3155	***BASIS:*** 2	Phase III - $3,450,000 ***TOTAL:*** $5,590,000	
LEAD ORGANIZATION(S): USACE		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): Dade County, SFWMD, Biscayne National Park (non financial partner)			
COUNTY(S): Dade		***TOTAL:*** $1,056,000 (Phase I) Fed/Non-Fed	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** SE06, SE29 **Associated with:** TS1, CE36			
START: 1997	***END:*** 2004	***TOTAL:*** $4,578,000 total project ***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Biscayne Bay is a shallow estuary located along the southeast coast of Florida. Biscayne Bay and its unique environment contribute to the economic health of the area through tourism, commercial and recreational fishing, and general recreation. The shoreline and bottoms of Biscayne Bay have been subjected to extensive alterations by local development and the C&SF Project. The cumulative impacts of these projects on water quality of Biscayne Bay are not known. An updated reconnaissance report was completed in July 1995 that proposed developing a modeling system for Biscayne Bay as the first step of a study to address effects of Federal projects on water circulation, biological communities, and water quality of the bay. The Corps executed a Feasibility Cost Sharing Agreement with Dade County for the Phase I effort in October 1995. Phase I is addressing the creation of a hydrodynamic model, Phase II will develop a water quality model, and Phase III will create biological models of the Bay. The study is authorized, a cost-sharing agreement has been executed by the Corps and Dade County for phase 1 and work is underway. Federal funds for Phase I were appropriated in FY 94, $206k was used to update the reconnaissance report and $550k was used to cost-share the Phase I of the feasibility report. Federal and non-Federal funds have not been secured for Phases II and III

RESTORATION BENEFITS: The goal of the Biscayne Bay ecosystem models is to provide to resource managers a tool to analyze and evaluate the hydrodynamic water quality and biological impacts on Biscayne Bay resulting from the implementation of proposed modifications to or changes in the operation of the C&SF Project.

Time Line and Fiscal Year Budget (in thousands of dollars) for Biscayne Bay Feasibility Study

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Phase I																
Phase II																
Phase III																
Project																
Subtotal																

TITLE: Comprehensive Water Quality Standards for Biscayne Bay			
SUBREGION : 8, 9	***PROJECT ID:*** SE29	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management/Science	***BUDGET CATEGORY:*** Natural Resources Management		
PROJECT PLAN MANAGER: Frost (305) 230-1144	***BASIS:*** 3	***TOTAL:*** $350,000	
		APPROPRIATED TO DATE:	
LEAD ORGANIZATION(S): NPS			
SUPPORTING ORGANIZATION(S): Dade County Department of Environmental Resource Management, SFWMD		***TOTAL:*** $0	
COUNTY(S): Dade, Broward, Monroe		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to:** SE28 **Associated with:** TS15		***TOTAL:*** $350,000	
START: 1997	***END:*** 1999	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Develop water quality standards to regulate and control nutrients and other pollutants being discharged into Biscayne Bay, Card Sound, and Barnes Sound. In northern Biscayne Bay many of the common biological processes have been lost or severely depressed because of habitat destruction. Water quality has also been adversely affected by stormwater runoff. Here the Bay has been degraded primarily because of development combined with a disregard of upland, wetland, and Bay interactions and the linkage between biological processes and high quality of water. This project would include the following phases of work: (1) locate and collate literature and unpublished data; (2) field verification of data and determination of its applicability to existing conditions; (3) prepare regulatory recommendations for action by Florida Legislature and possibly the EPA.

RESTORATION BENEFITS: These standards will be applied by all levels of government to prevent further degradation and restore water quality in the bay. As the local area continues to develop and as restoration efforts are implemented within developed areas as well natural areas within the South Florida ecosystem, water quality standards are needed so that Federal, State, and county agencies can prudently manage the growth of the greater Miami area.

For many years Biscayne Bay has been ecologically degraded by habitat destruction, hydrologic alterations and a wide variety of water-borne pollutants, including urban and agricultural runoff, industrial discharges, and sewage. Specific water quality standards would aid in more effectively controlling the type and quantity of pollutants discharged, by providing regulatory agencies with the authority to apply needed controls. The benefit would ultimately bring an improvement in the ecological condition of the Bay.

Time Line and Fiscal Year Budget (in thousands of dollars) for Comprehensive Water Quality Standards for Biscayne Bay

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
																350
Subtotal																**$350**

TITLE: : Ground-Water Quality Discharge Standards		FARM BILL PRIORITY: 27	
SUBREGION : 4	***PROJECT ID:*** SE32	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Information Management and Assessment		
PROJECT PLAN MANAGER: Dick Frost/Curry (305) 239-1144	***BASIS:*** 1	***TOTAL:*** $750,000	
LEAD ORGANIZATION(S): FDEP or EPA		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): SFWMD, Dade County Department of Environmental Resource Management			
COUNTY(S): All		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to**: TS08 **Associated with:** SE29		***TOTAL:***	
START: 1997	***END:*** 1999	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The project is intended to establish limits on the type and content of pollutants that are disposed underground into water bearing zones. It would explore the development of standards for the purpose of identifying harmful water-borne contaminants and regulatory limitations or criteria that would be applied to reduce or eliminate contamination of ground-water resources in the South Florida ecosystem.

As the population of South Florida continues to grow, there is an increasing use demand upon ground water, as well as an increasing potential for contamination of that limited resource. For example, there are currently proposals intended to increase surface-water availability and usability through decontamination and storage. The impact of these is not yet fully understood, but some appear to have the potential for causing significant ground-water contamination. Deep well injection, a current activity, is used to dispose at depth below freshwater zones a wide variety of wastes, the impact, also, of which is not known. In view of suggestions to use water from the Floridian aquifer to raise water levels in the Everglades ecosystem, and the critical importance of ground water as the fundamental drinking water supply, there is a urgent need to identify both the types and limitations of pollutants that can safely be disposed of in this manner.

RESTORATION BENEFITS: Standards for subsurface waste disposal into water bearing strata would provide protection of drinking water supplies in the Biscayne and deeper Floridian aquifers. Standards should be established for the discharge of waste into these aquifers as well as for the aquifers themselves.

Time Line and Fiscal Year Budget (in thousands of dollars) for Ground-Water Quality Discharge Standards																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
FDEP EPA																
Subtotal																

TITLE: Ground-Water Quantity in Coastal Environments			
SUBREGION : 7	***PROJECT ID:*** SE33	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Water Quality		
PROJECT PLAN MANAGER: Dick Frost/Curry (305) 230-1144	***BASIS:*** 2	***TOTAL:*** $400,000	
LEAD ORGANIZATION(S): FDEP or EPA		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): SFWMD, Dade County Department of Environmental Resource Management			
COUNTY(S):		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** SE32 **Critical to:** TS08 **Associated with:**		***TOTAL:***	
START: 1997	***END:*** 1999	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project will result in a ground-water hydrology model for the South Florida ecosystem, and will consist of three phases: (1) locating and collating existing published and unpublished data; (2) conducting field verification of existing data and determining applicability to existing ground-water quality and quantity conditions; (3) analyzing data and developing a set of regulatory recommendations for action by the Florida Legislature and possibly the Environmental Protection Agency.

RESTORATION BENEFITS: The restoration of the South Florida ecosystem will require the reallocation of Florida's freshwater resources to provide the quantity of water needed by the Everglades ecosystem. Only recently has there developed widespread concern over the ground-water component of the hydrologic balance and its relation to overall restoration and the continued availability of the important resource. There currently is inadequate information on ground-water hydrology (flow, distribution, movement, recharge/discharge, etc.) and particularly what impacts restoration activities will have on it. This project will develop a conceptual model of ground-water hydrology for the South Florida ecosystem that will aid in designing restoration activities that benefit the total hydrologic balance and preserve and maintain the critical ground-water resource of South Florida.

Time Line and Fiscal Year Budget (in thousands of dollars) for Ground-Water Quantity in Coastal Environments																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
FDEP EPA																
Subtotal																**300**

TITLE: Surface Water Management Master Plan for the Former Homestead Air Force Base			
SUBREGION : 4	***PROJECT ID:*** SE34	***FINANCIAL REQUIREMENT:*** TBD	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Area Management		
PROJECT PLAN MANAGER: Pedro Hernandez 305-876-7928	***BASIS:*** 1	***TOTAL:***	
LEAD ORGANIZATION(S): Dade County Aviation Dept., USAF		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): State of Florida			
COUNTY(S): Dade		***TOTAL:***	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** SE01 **Critical to:** SE06 **Associated with:**		***TOTAL:***	
START:	***END:***	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The project involves preparing a Surface Water Management Master Plan for the Homestead Air Reserve Station and the proposed Homestead Regional Airport that would provide an ecologically sound guide for redeveloping the former Homestead Air Force Base. It would involve exploring the best approach to address flood control, water quality, water quantity, wetland protection, and other water resource issues related to the redevelopment of the Base. The plan's principle goal will be to minimize the quantity and improve the quality of, off-site discharges, and other water resource issues. The plan shall provide that all new development and re-development will, at a minimum, comply with all District and Dade County regulatory criteria in effect at the time of application, including requirements for on-site stormwater detention, industrial stormwater management, and requirements to implement surface water management Best Management Practices.

RESTORATION BENEFITS: As the U.S. Air Force rapidly moves toward conveying the Homestead Air Force Base to Dade County, there is increased pressure to redevelop the base as a major regional airport. A sound surface water management plan would ensure compatibility between South Florida ecosystem restoration efforts and the redevelopment. To ensure the protection of the resources of Biscayne National Park and the coastal resources of the South Florida ecosystem, a comprehensive Base surface water management plan needs to be in place before, or close to the time of final conveyance of the Base.

Time Line and Fiscal Year Budget (in thousands of dollars) for Surface Water Management Master Plan for the former Homestead Air Force Base

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Plan																
Project																
DERM																
Subtotal																

TITLE: New River Forest Restoration Project			
SUBREGION : 4	***PROJECT ID:*** SE35	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management/Public Education	***BUDGET CATEGORY:*** Natural Resource Management Habitat Protection	Incomplete due to lack of management plans. Exotic Vegetation Control Shoreline Stabilization Boardwalk & Signage	 500,000 750,000 750,000
PROJECT PLAN MANAGER: Eric Myers (954/519-1230)	***BASIS:*** 2	***TOTAL:***	**$**2,220,000
LEAD ORGANIZATION(S): Broward County		***APPROPRIATED TO DATE:*** Rewatering project	 $ 220,000
SUPPORTING ORGANIZATION(S): SFWMD			
COUNTY(S):		***TOTAL:***	$ 220,000
LINKED PROJECTS: **Dependent on:** CE22 **Critical to:** **Associated with:** TS14, SE15		***REMAINING FINANCIAL REQUIREMENT:*** Exotic Vegetation Control Shoreline Stabilization Boardwalk & Signage ***TOTAL:***	 500,000 750,000 750,000 $2,000,000
START: 1997	***END:*** 2005	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The New River Forest (Pond Apple Slough Ecosystem) Restoration Project will help restore the remaining 200+ acres of freshwater riverine forest system adjacent to the South Fork of the New River. The various tracts of forest are in a variety of public and private ownerships and would benefit from implementation of an area-wide management plan. Important management needs include exotic vegetation control, shoreline stabilization and salinity management. Some aspects of this are being addressed through mitigation funding while other elements remain unfunded. In addition, the site(s) offer great potential for environmental education and research opportunities. Funding is being sought to construct a boardwalk with signage and to assist in exotic vegetation control in the various parcels. This area is also included in the Broward Urban River Trails - A Link in the Florida Greenways System.

RESTORATION BENEFITS: The project would help ensure the preservation of the largest remaining stand of freshwater riverine forest in the Lower East Coast and Urban Area District (Subregion 9). Presently, access is very limited and could be improved to provide important environmental educational opportunities in the region.

Time Line and Fiscal Year Budget (in thousands of dollars) for New River Forest Restoration Project

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Rewatering																
Veg Control																
Shore Stabilization																
Board/Signage																
Project																
Rewatering	10	50	120	40												220
Veg Control																500
Shore Stabilization																750
Board/Signage																750
Subtotal																**$2,200**

TITLE: Stock Structure and Abundance of Bottlenose Dolphins in Biscayne Bay			
SUBREGION : 4	***PROJECT ID:*** SE36	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research		
PROJECT PLAN MANAGER: Steve Swartz 305/361-4487	***BASIS:*** 3	***TOTAL:*** $ 160,000	
LEAD ORGANIZATION(S): NMFS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S):		***TOTAL:*** $70,000	
COUNTY(S): Dade		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** SE28,SE29, SE30 **Critical to:** SE06,SE10,SE17,SE18 **Associated with:** SE17		***TOTAL:*** $90,000	
START: 1990	***END:*** 2000	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The bottlenose dolphin (*Tursiops truncatus*) is protected under the Marine Mammal Protection Act (MMPA). The NMFS is responsible for establishing quotas for incidental takes of dolphins and for monitoring their populations. In 1987, NMFS began funding several local research efforts in the southeast U.S. to detect large-scale changes in abundance and establish archival databases for trend detection. The Biscayne Bay population of dolphins has been assessed by photo-identification since 1990. Baseline data indicate the present population is small (~100 animals) relative to the size of the study area. Many dolphins were likely removed from the Bay for the display industry prior to passage of the MMPA in 1972, and this may have significantly affected population size and productivity. The population may also have been impacted by declining water quality. Most dolphins in Biscayne Bay are resident. Some of the animals, however, are transient and may contribute to the Western North Atlantic stock of dolphins, which is listed as depleted under the MMPA because of major mortality events. Analysis of data is needed to evaluate the contribution of the Biscayne Bay population to this stock and determine need for future sampling. Project objectives are to: 1) evaluate residency patterns of dolphins within the bay, 2) compile a dorsal fin catalog for the bay, 3) elucidate stock structure and determine local movements and migratory patterns of individual dolphins through comparison of spatio-temporal occurrence data and dorsal fin photos, 4) estimate and monitor population size, and 5) correlate environmental data (e.g., DERM, FDEP) with occurrence of dolphins in the bay.

RESTORATION BENEFITS:. The bottlenose dolphin is one of the most visible species in Biscayne Bay, including Biscayne National Park. The information provided by this project is critical for monitoring the status of this population and evaluating a future recovery. It is also critical for determining the significance of the Biscayne Bay population to the depleted Atlantic stock of bottlenose dolphins. Risk assessment must account for stock interactions, and to fully understand the implications of management decisions or catastrophic events the biological basis of stock designations must be evaluated. The origins of individuals determine their exposure to disease and risk of transmission; movement of individuals between stocks can have potentially serious impacts. Stock designations could provide information on dolphins' history of exposure to contaminants and potentially lead to mitigation of pollution sources. Tissue samples collected for genetic printing can also be analyzed for contaminants. As the largest resident population of predators in Biscayne Bay, dolphins may be excellent contaminant markers and indicators of estuarine health.

Time Line and Fiscal Year Budget (in thousands of dollars) for Stock Structure and Abundance of Bottlenose Dolphins in Biscayne Bay

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Photo Surveys		■	■	■												
Data analysis		■	■													
Project																
Surveys		15	20	20												55
Analysis		15	20													35
Subtotal																**$90**

TITLE: : Dade County Environmentally Endangered Lands Program			
SUBREGION : 4	***PROJECT ID:*** SE37	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition & Area Management	Dade County: $ 92,833,000 Florida Communities Trust: $ 2,600,000 FDEP $ 3,950,000	
PROJECT PLAN MANAGER: Dade Co: Young (305) 375-3614	***BASIS:***	***TOTAL:*** $ 99,383,000	
LEAD ORGANIZATION(S): Dade County		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): Florida Communities Trust Fl. Dept. Of Env. Protection		Dade County: $ 57,000,000 Florida Communities Trust: $ 1,700,000 FDEP $ 3,950,000	
COUNTY(S): Dade		***TOTAL:*** $ 62,650,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***REMAINING FINANCIAL REQUIREMENT:*** Dade County: $ 35,833,000 Florida Communities Trust: $ 900,000 ***TOTAL:*** $ 36,733,000	
START: 1991	***END:*** Unknown	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project includes 3,900 acres in Dade County, 260 of which have been acquired. Sites approved for acquisition include the best remaining highly endangered pine rockland outside of Everglades National Park, the most outstanding examples of rockland hammock that remain in Dade County, small scrub sites and coastal wetlands. Most of the remnant upland forest sites within the urban development boundary are developable, and some of those outside the boundary could be cleared for agricultural use. All sites are zoned residential, agricultural, or general use. The native habitats, are also sensitive to adjacent development and agricultural activities. The Dade County EEL Program actively seeks to match its acquisition funds. The EEL Program is actively acquiring CARL lands in Dade County as part of a Dade County Archipelago Bargain Share Agreement with the CARL Program, and is acquiring the 49,000 acre South Dade Wetlands project with the South Florida Water Management District's Save Our Rivers Program sharing the estimated $50 million cost.

RESTORATION BENEFITS: The globally endangered rockridge pinelands occur exclusively on the Miami Ridge. Both pinelands and hammocks have been dramatically reduced in acreage by urbanization. Numerous endemic, rare, and endangered plant species and several rare endemic animal species occur within the project area. The lands will be used as preserves for the unique and endangered plant communities. The sites will provide connections with existing natural areas, increase their effective size, thereby improving their sustainability. In some cases the acquired sites will buffer important natural areas from the detrimental impacts of urban development.

Time Line and Fiscal Year Budget (in thousands of dollars) for Dade County Environmentally Endangered Lands Program

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Acres to be Acq	85	96	138	184	184	138	138	92	46	46	46				2,309	3,640
Project																
Purchase Price	1091	2200	4260	4680	4680	3260	3260	1840	1500	1000	1000				6,462	36,733
Subtotal																

TITLE: Military Canal Remediation			
SUBREGION : 4	***PROJECT ID:*** SE38	***FINANCIAL REQUIREMENT:*** TBD	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Water Quality, Habitat Protection, Infrastructure Investment		
PROJECT PLAN MANAGER: Richard Frost (305) 230-1144	***BASIS:***	***TOTAL:***	
LEAD ORGANIZATION(S): NPS, EPA		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): FDEP, SFWMD , Miami-Dade DERM			
COUNTY(S): Miami-Dade County		***TOTAL:***	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** SE06 **Associated with:** SE01		***TOTAL:***	
START: 1997	***END:***	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Scientific data is available from past studies and will soon be available from a study being completed by EPA, to further identify the characteristics, degree, and extent of contamination in Military Canal. Based on this analysis, the participating agencies will agree on the appropriate action, lead agencies, and funding sources. The proposed project will (1) Evaluate alternatives for remediation of contaminants in Military Canal using available scientific and engineering data, (2) prepare engineering design and specifications for selected alternative, and (3) implement the selected alternative.

RESTORATION BENEFITS: Sediments in Military Canal have been found to hold contaminants which could end up in Biscayne Bay and Biscayne National Park. There is concern that the existing contaminants may be conveyed to Biscayne National Park during flow events, leading to further sediment and water quality degradation.
Canal improvements achieved through this project will be integrated into broader stormwater management actions for this part of South Florida, including improvement of quality, quantity, timing, and distribution of surface water and sediments into Biscayne Bay and Biscayne National Park.

TITLE: Biscayne Bay Ecosystem Risk Assessment			
SUBREGION : 4	***PROJECT ID:*** SE39	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Water Quality & Habitat Protection		
PROJECT PLAN MANAGER: Dick Frost 230-1144	***BASIS:*** 3	***TOTAL:*** $ 1,200,000	
LEAD ORGANIZATION(S): NPS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): DERM, SFWMD, USACE, Univ. Of Miami			
COUNTY(S): Dade		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** TS01; SE05; SE06; SE30; SE29; LEC22-I; Cumulative Stressors		***TOTAL:*** $ 1,200,000	
START: 1998	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Biscayne Bay comprises a unique set of biotic communities that includes coastal mangrove forest, seagrass flats, islands, and coral reefs. These ecosystems contribute to the long-term economic health of the region through tourism, valuable fishery resources, and recreational opportunities. Biscayne Bay has been subject to significant changes in water quantity and quality from local urbanization and the alteration of surface and ground water flows. The proposed project would assess the ecological risks associated with basin-wide changes in water quality and water delivery schedules on biotic communities in the bay and reef tract. To accomplish this, quantitative baseline ecological information would be collected in each major biotic community (Task 1). Community structural and functional elements will be employed to establish biotic indices that will permit an evaluation of biological integrity and aquatic health (Task 2). Links between canal inflow and ecosystem components will be integrated employing bay circulation models to establish a relationship between bay inflow, water quality, seagrass production, upper trophic level consumers such as fish, and biotic indices (Task 3). This integrated model will permit assessment of risks and environmental impacts from changes in water quality, quantity, and inflow schedules. This project relies in part on results of current research (Cumulative Effects of Natural and Anthropogenic Stressors; Biscayne Bay Feasibility Study) to provide a framework of related landscape elements and the relative importance of identified anthropogenic stressors. The proposed project will develop quantitative relationships between stressors and ecosystem elements for predictive models to evaluate the consequences of water and land management actions on the biotic communities of Biscayne Bay.

RESTORATION BENEFITS: Changes to water management operations in South Florida that will be required by implementation of the C&SF Project Restudy for ecosystem restoration will result in changes to surface and groundwater delivery to Biscayne Bay. This will result in large-scale changes to salinity patterns in the bay and in effluent concentrations in canals. The impacts of these actions to the integrity and health of bay ecosystems are not known. This information is critical for understanding the consequences of regional water management alternatives on biotic communities in Biscayne Bay and the reef tract. This project will provide the means for assessing water and land management options for restoration and protect the integrity of Biscayne Bay ecosystems.

Time Line and Fiscal Year Budget (in thousands of dollars) for Biscayne Bay															
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total

Task 1																
Task 2																
Task 3																
Task 4																
Project																
		510	265	175	250											**1200**
Subtotal																$1,200

TITLE: Cumulative Effects of Natural and Anthropogenic Stressors			
SUBREGION : 4, 6	***PROJECT ID:*** SE40	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research		
PROJECT PLAN MANAGER: Carole Goodyear 305/361-4255	***BASIS:*** 3	***TOTAL:*** $6,250,000	
LEAD ORGANIZATION(S): NOAA Coastal Ocean Program		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): University of Miami Center for Marine and Environmental Analyses			
COUNTY(S): Dade, Monroe		***TOTAL:*** $2,650,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** TS62, SE28, SE29, CE18, FK14, FK15, FK17, FK18, FK21, SE30, SE06, SE10, SE17, SE18, SE20,		***TOTAL:*** $3,600,000	
START: 1995	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This is a multiyear research program that addresses ecosystem issues on community to landscape levels in the geographic area of Biscayne Bay through the upper Florida Keys reef tract to Long Key. The program is developing integrated seascape-level models supported by laboratory and field research and designed to produce an integrated decision-support system for managers and policymakers. The primary foci for research and assessment activities are sustainability of the fish community, ecosystem integrity of the coral reef tract, and ecosystem integrity of the Biscayne Bay system. For the bay, emphasis is on mapping change in distribution of habitats, modeling stability of the habitat mosaic, characterizing habitat qualities important to fish community sustainability, and addressing primary anthropogenic stressors affecting mangrove and seagrass communities. For the reef tract, emphasis is on characterizing health of the system relative to spatial distribution and changes in community composition or productivity in response to natural or anthropogenic stressors. The study also includes a societal component to illustrate the connections between society' s actions and choices and resultant environmental effects. All information will be integrated into a framework that can be used to identify critical linkages between society and ecological systems, rank the associated risks, and predict consequences of management options on the health and sustainability of the region's ecological and societal systems.

RESTORATION BENEFITS: This is the only comprehensive research program addressing community to landscape and seascape level issues in the area of Biscayne Bay through the Upper Keys. It will provide a management and risk analysis framework capable of addressing the complex environmental and societal issues that characterize the coastal environment of South Florida.

Time Line and Fiscal Year Budget (in thousands of dollars) for Cumulative Effects of Natural and Anthropogenic Stressors																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
		1,800	900	900												3,600
Subtotal																**$3,600**

TITLE: Western C-11 Basin Water Quality Improvement Project			
SUBREGION : 4	***PROJECT ID:*** SE41	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure, Management	***BUDGET CATEGORY:*** Infrastructure		
PROJECT PLAN MANAGER:	***BASIS:***	***TOTAL:*** $8,600,000	
Melissa Dollar 904/232-2584	1	***APPROPRIATED TO DATE:***	
LEAD ORGANIZATION(S): USACE			
SUPPORTING ORGANIZATION(S): SFWMD, local drainage districts			
COUNTY(S): Broward		***TOTAL:***	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** ENP5-I **Associated with:** ENP1-I, WCA3A-I, TS1		***TOTAL:*** $8,600,00	
START: 1997	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The purpose of this project, proposed for funding under the WRDA 1996 Critical Project authority, is to improve the quality and timing of stormwater from the C-11 Basin to the Everglades Protection Area. The project will be located in the C-11 basin at the S-9 structure, located in Broward County at the west end of the South new River Canal (C-11). The S-9 structure pumps untreated urban and agricultural stormwater runoff into WCA-3 from the South New Riv er Canal, and pump seepage under Levees 33 and 37 back into WCA 3.

Concern has been expressed in a num ber of interagency venues regarding the quality of water discharged through S-9. Be cause S-9 discharges directly into the Everglades Protection Area, these discharges must meet the new Class III Water Quality Stan dards by 2006. Furthermore, the Modi fied Waters Deliveries to ENP Project will construct structures (or gaps) in the L-67 levees that will allow water to flow freely from the S-9 discharge point, down the L-67 ca nal and directly into the relatively pristine WCA-3B. S-9 water quality concerns have surfaced for discussion at meet ings of the Governor's Com mission, the Everglades Technical Advisory Committee, the SFER Working Group, the Water Quality Task Team for the Southern Ever glades Restoration Alliance and through the non-ECP per mit process. Representatives of the Miccosukee Indian Tribe have also voiced water quality issues.

This project will include: 1) water quality monitoring in selected reaches of the Western C-11 Canals and analysis of the sediments, 2) development of suitable Best Management Practices in areas where the water quality concerns are identified, 3) structure and/or operational changes to the s-9 structure and the western C-11 basin water management system (e.g., modifications that will allow slower pumping rates so as to not disturb canal sediments), 4) structural or operational changes in the secondary drainage system.

RESTORATION BENEFITS: This project is one component of a more comprehensive strategy for improving water quality in the Western C-11 Basin Restoration benefits will include: 1) will help to ensure that S-9 discharges meet Class III Water Quality Standards for the Everglades; 2) will reduce phosphorus loading to the Everglades Protection Area which will help to protect the long term ecological integrity of Everglades National Park; 3) will re duce eutrophi c impacts within the public Everglades; and 4) will reduce loads of other pollutants (e.g. pesticides, heavy metals, etc.);

Time Line and Fiscal Year Budget (in thousands of dollars) for																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Design																
Land Acquisition																
Project																
		400	1000	1600	2500	3000										
Subtotal																

TITLE: Agriculture and Rural Land Retention Study			
SUBREGION : 4	***PROJECT ID:*** SE11	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research		
PROJECT PLAN MANAGER: Lee Rawlinson 305/372-2557	***BASIS:*** Gov.'s Com. Rec.#73	***TOTAL:*** $950,000	
LEAD ORGANIZATION(S): Dade County, SFWMD, DCA, Dade County Farm Bureau		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): NRCS, IFAS/ES , FDACS			
COUNTY(S): Dade		***TOTAL:*** $400,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** CE20 **Associated with:** TS06, TS07, SE04		***TOTAL:*** $550,000	
START: 1997	***END:*** 1999	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project will examine agricultural and rural land use trends in Dade County. Agricultural industry practices associated with each major crop (or commodity), combined with existing surface and ground water hydrologic data, will be inventoried and analyzed. Economic data will be evaluated to establish strategies that will strengthen and sustain Dade County's agricultural industry. Policies and implementation initiatives will be developed for the purpose of preserving and promoting environmentally sound agriculture and rural character in this 180 square mile area. Specific project goals are to : 1) determine whether, and the extent to which, the County, SFWMD and other regulatory agencies (local, State and Federal) should adjust existing and establish new policies to retain agriculture as a viable economic land use in south Dade County; 2) determine the extent of this area in which such policies should be implemented; 3) determine any additional land uses and development standards that should be authorized to maintain or promote recommended agricultural and rural development; 4) develop a plan to accomplish the foregoing purposes, including implementation programs and actions.

RESTORATION BENEFITS: Dade County has in the past, and continues to have a very high rate of population growth. The growing demands of the lower east coast of Florida are straining the water resources of the area at a time when the need for ecological restoration is approaching a critical point. The development of sustainable, environmentally sensitive agriculture in south Dade County would provide a more environmentally superior land use than the prospect of uncontrolled urban expansion throughout these watershed. In comparison to urban development, agriculture has greatly reduced impacts on water quality and quantity, thus minimizing remediation requirements and costs. This project is prudent in addressing the political reality of coping with the increasing demands of urban growth and the need for sustainable agriculture within this critical south Dade area, adjacent to both Everglades and Biscayne National Parks.

Time Line and Fiscal Year Budget (in thousands of dollars) for Agriculture and Rural Area Retention Plan

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Project& Plan																
Project																
Project & Plan	100	400	450													950
Subtotal																**$950**

3.6 *SOUTHWEST FLORIDA/BIG CYPRESS BASIN*
Sub-Region 5

ECOLOGICAL SETTING:

The Southwest Florida/Big Cypress Basin (SW/BCB) extends north from Everglades National Park (ENP) to the Caloosahatchee River watershed, and east from the Gulf of Mexico to the L-4 and L-28 canal systems and Lostmans Slough. It includes southern Lee and Hendry, all of Collier, and small portions of western Broward and Dade, and northwestern Monroe counties.

The region provides significant habitat for many threatened and endangered species and species of special concern, including the American bald eagle, Florida panther, woodstork, snail kite, snowy plover, Florida sandhill crane, red-cockaded woodpecker, Big Cypress fox squirrel, Florida black bear, alligator, limpkin, Everglades mink, crocodile, Loggerhead sea turtle, West Indian manatee, snook, jewfish, gopher tortoise, Eastern indigo snake, many species of wading birds and migratory shore birds and songbirds.

The slash pine forests of southwest Florida have been identified as an endangered ecosystem. This sub-region, along with the western Greater Okeechobee sub-region, may have the State's greatest acreage of hydric pine flatwoods, which have significant ecological and hydrological value. Plant species diversity is high, with over 900 species, including 85 protected species. At least 21 Federal and State listed animal species are supported by the flatwoods communities important to groundwater recharge.

The sub-region also encompasses tremendous acreages of ecologically valuable wetlands. Big Cypress National Preserve (BCNP) and its Addition Lands, is approximately 728,000 acres of swamplands. It is dominated by seasonally flooded cypress savannas and freshwater marshes interspersed with islands of slash pine and mixed hardwood hammocks. The BCNP is about one-third covered with cypress trees, mostly dwarf pond cypress. The few remaining giant bald cypresses, escapees of the lumber era, may be 600-700 years old.

Fakahatchee Strand, over 74,000 acres in size, is the center of native U.S. orchid species diversity. The Corkscrew Regional Ecosystem Watershed (CREW) is more than 58,000 acres of mostly functional wetlands. It supports North America's largest nesting colony of endangered wood storks and largest remaining stand of virgin bald cypress. Within CREW is the 1,500-acre Lake Trafford, the largest freshwater lake in the region. Lake Trafford supports significant bass and other fish, invertebrate, and bird populations. The CREW provides habitat for about 75 protected plant and animal species, as well as having significant hydrologic importance by conveying water to the Florida Panther National Wildlife Refuge (NWR), Fakahatchee Strand State Preserve, Rookery Bay, and Estero Bay Aquatic Preserve and Buffer Reserve watersheds. Okaloacoochee Slough encompasses approximately 140,000 acres of mostly priority 1 habitat for Florida panthers. Other significant wetland areas lie within the Big Cypress Area of Critical State Concern (ACSC); Belle Meade and Southern Golden Gate land acquisition projects; Picayune Strand State Forest; the Florida Panther and 10,000 Islands National Wildlife Refuges; and Collier-Seminole State Park.

The coastal areas in this subregion are characterized by mangrove dominated estuaries with salt marsh habitats occurring landward of the mangrove zone. They generally provide a rich and abundant fish and shellfish nursery, as well as supporting bottlenose dolphin, the endangered West Indian Manatee, and an abundance of wading and shore bird species. Seagrasses, oyster bars, and mudflats are common benthic habitats. Beaches and dunes provide critical nesting habitat for many species of protected migratory shore birds and the threatened Loggerhead sea turtle. Important protected beach/dune and estuarine areas include Delnor-Wiggins Pass and Barefoot Beach State Recreation Areas; Estero Bay Aquatic Preserve and Buffer Reserve, Rookery Bay Aquatic Preserve and National Estuarine Research Reserve, the Ten Thousand Islands Aquatic Preserve and National Wildlife Refuge; the Estero Bay Tributaries and the Wiggins Pass/Cocohatchee Estuary Outstanding Florida Waters (OFW), and the Little Estero, Caxambas, and Big Marco Critical Wildlife Areas.

LINKAGE TO THE TOTAL SYSTEM:

Water from the basin flows south and southwest to provide freshwater for the estuaries along the southwest coast, including the Ten Thousand Islands National Wildlife Refuge and Aquatic Preserve, Rookery Bay National Estuarine Research Reserve and Aquatic Preserve, southwestern Everglades National Park (ENP), and indirectly to Florida Bay. The basin also provides water for several southwest Florida communities. Ecological connections between Everglades National Park and the Big Cypress basin are evident, resulting in similar concerns and scientific needs for both sub-regions. The extensive, contiguous areas are distinguished by the large proportion of officially designated wilderness area (in ENP) and by Federal ownership for controlled-use purposes of most of the southern and eastern portion of the BCNP. Development impacts in the remainder of the subregion have a direct effect on ecosystem health within the Everglades basin.

ECOSYSTEM ISSUES AND RESTORATION OBJECTIVES:

Southwest Florida is undergoing tremendous development pressure and has had the highest growth rate in Florida during the last ten years. During the 1950s-1970s, several large-scale residential developments along with major road and drainage projects were constructed throughout the region, causing loss of both wetland and upland habitat, lowering of the water table, and impacts to the region's rivers and estuaries. Incorporated cities include Naples, Ft. Myers Beach, Marco Island and Everglades City. Rapidly developing areas include northern Collier County, northern Golden Gate Estates, Estero, Immokalee, and Bonita Springs.

Recent plans for expanding the Southwest International Airport and constructing Florida Gulf Coast University has spurred development pressure to new levels. Agriculture is a major industry in the area, especially citrus and winter vegetables. Until recently, conversion of natural lands to agriculture occurred at an even greater rate than residential and commercial development in some areas of the basin. There is concern about potential effects on plants, wildlife, and their habitats and on surface and ground water quality and quantity. Some citrus development projections estimate that up to 50% of available Florida panther habitat in the Immokalee Rise area may be lost. Citrus also uses more water per acre than any other type of agriculture, except plant nurseries. There is concern over the

potential impacts for water table drawdown.

Construction of the Tamiami Trail in 1928, the first east-west road across the basin, altered the natural timing and distribution of surface water flow. Since then, other residential road and canal systems have altered natural freshwater sheetflow patterns to the estuaries, resulting in increased rates of runoff and substantial point loads of contaminants. As a result, salinity patterns have changed, the estuarine nursery value for fish and shellfish has decreased, fisheries and seagrass abundance have been reduced, and nutrient loading has increased. One of the most significant examples of this was the development of Golden Gate Estates in the 1950s, which includes approximately 200 square miles of road and drainage canal development in wetlands east of Naples. This project continues to cause drawdown of the water table, impacts to wildlife habitat, increased fire, and unnatural discharges of large volumes of freshwater into the Ten Thousand Islands estuary.

Water quality in the urban estuaries continues to decline as a result of non-point source discharges. Nutrient and turbidity levels are on the rise in the estuaries, and concentrations of heavy metals indicative of polluting conditions (including cadmium, lead, copper and zinc) are found in the sediments. Fresh water systems have suffered a swell. The once sandy substrate of Lake Trafford, which had supported important submerged aquatic vegetation, is now buried under 7 million cubic yards of muck caused by nutrient-rich runoff and chemical aquatic weed control practices. The high biochemical oxygen demand of the muck causes periodic massive fish kills in the lake. Water quality within the BCNP is generally considered to be good to excellent. However, runoff from citrus and other farming operations upstream of the BCNP has long been a concern. Indian lands of the Miccosukee and Seminole Tribes, an important component of the basin, receive surface water that is contaminated with high concentrations of nitrogen, phosphorus, heavy metals, and other pollutants. These pollutants are generally attributed to intensive upstream agricultural development and other anthropogenic activities.

This pollution has resulted in contaminated fish and wildlife, which tribal members consume as part of their traditional subsistence hunting and fishing lifestyle, and significant economic and recreational fisheries and ecotourism for urban/rural communities. The pollution has resulted in conversion of wetlands to areas lacking the natural plant and animal diversity of the past. The subsurface strata contribute nutrients to the groundwater affecting the surface flora and fauna. Subsurface investigations are needed to provide the required data to understand the subsurface stratigraphy and its groundwater impacts to the South Florida Ecosystem.

Vegetation in conservation areas of the Big Cypress Basin has not been substantially altered compared to other sub-regions, but is threatened by the invasion of a variety of exotic plants. Melaleuca, in particular, now occupies about 6% of the BCNP and resists control efforts. This and other invasive species may lower the water table and hasten extinction of native species. Non-native fishes have colonized natural and disturbed habitats during the past three decades. Documented impacts include predation, nest-site competition, and habitat disturbance. Without strict border controls, relevant legislation, and support from the nursery industry, more exotic species will invade with unknown ecological consequences.

Continued loss of floral and faunal diversity from upland communities is of great concern. Though issues of biodiversity are frequently discussed in relation to wetlands, many of the known and imminently threatened losses of

species in the basin appear to be associated with uplands.

Slash pine forest ecosystem acreage in Southwest Florida declined 88% from 1900-1989. Large acreages of hydric pine flatwoods have been lost to logging, development, and agriculture activities. Habitat destruction from residential and commercial development continues. Agricultural conversion has abated, but there are many large permits pending. Approximately 130,000 acres of citrus exist, with approximately 500,000 acres currently permitted. Melaleuca and other invasive exotic plants are a serious ecological problem.

Principal threats to survival of the Florida panther are habitat loss, automobile traffic, and inbreeding. Survival of Florida's state mammal is dependent on stabilizing the extant population, genetic restoration, and reintroduction elsewhere in its historic range. With the exception of the well-studied panther, black bear, and white-tailed deer, there is only limited information on the biology or population ecology of most native mammals. In addition, the ecological consequences of an expanding population of feral pigs have not been measured.

The total number of wading birds nesting in the Big Cypress and Everglades Basins has declined by more than 95% from peak estimates of nesting birds in the 1930s. Impacts of altered hydropatterns include (1) reduced number of birds attempting to nest, (2) relocated colonies, (3) changed timing of nesting, and (4) fewer years of successful nesting.

Several initiatives with public and private interests have formed to address the problems associated with the intense development pressure being experienced in this environmentally sensitive region. Some of these include the Southwest Issues Group of the Governors Commission for a Sustainable South Florida, Southwest Coast Ecosystem Management Team, Estero Bay Agency for Bay Management, Southwest Focus Group, Panther and Private Lands team, Lake Trafford Restoration Task Force, Southern Golden Gate Technical Committee, Big Cypress Basin Science Steering Committee, Greenways and Trails, and others.

RESTORATION OBJECTIVES:

The restoration objectives of critical importance for Sub-region 5 have been identified by the Working Group and are listed as follows:

- Restoration of more natural distribution, timing and quantities of fresh water into the coastal estuaries.
- Improvement to water quality by addressing point source and non-point source discharges.
- Restoration of degraded habitat, and minimization of further habitat loss.
- Protection of flood plains from further development to minimize needs for additional drainage projects.
- Improvement of aquifer recharge, and protection of ground water from pollutant loading, saltwater intrusion.
- Promotion of best management practices to agriculture, development, local governments, and the general public.
- Protection, buffering, and management of existing public lands.

RESTORATION PROJECTS:

Important restoration projects in progress or proposed for the Sub-region are identified on the following pages:

TITLE: Additional Water Conveyance Structures Under Tamiami Trail			
SUBREGION : 5	***PROJECT ID:*** SW01	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Infra Invest, Natl Res Man.	Potential cost shares: SFWMD, FDOT, FDEP, NPS, USGS	
PROJECT PLAN MANAGER: Hibbard (941) 695-2000	***BASIS:*** 2	***TOTAL:*** $15,000,000	
LEAD ORGANIZATION(S): NPS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): SFWMD, FDOT, FDEP, USGS			
COUNTY(S): Collier		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** SW24 **Critical to:** SW03, SW05, SW10, SW11 **Associated with:**		***TOTAL:*** $15,000,000	
START: 1998	***END:*** 2003	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: U.S. Highway 41 (Tamiami Trail), constructed in the 1920's, is a two-lane highway in south Florida that connects Miami to Naples. Currently, the Tamiami Trail impedes the north-south sheetflow in Ten Thousand Islands, Southern Golden Gate Estates, Fakahatchee Strand, Big Cypress National Preserve, Water Conservation Area 3A, and Everglades National Park, which is critical to supporting the regional wetland ecosystems. The existing bridges and water control structures are inadequate for transmitting surface water beneath the Tamiami Trail- The elevated roadbed of the Tamiami Trail is a physical barrier to the natural surface water sheetflow. The borrow canal immediately north of the Tamiami Trail intercepts this south-southwest flow and transfers it to an east-west flow direction until it exits south through bridges or water control structures. Currently, due to this channelization of flowways, some wetland habitats receive too much freshwater, while others do not receive enough. Also, the seasonal hydropatterns (quantity, timing and distribution of surface water flows) are interrupted.

This project will help to restore a more natural hydropattem to the southern Big Cypress Basin (Subregion 6) and Coastal Areas (Subregion 8). This project will be accomplished in three phases: Phase I - conduct a comprehensive assessment of the hydrological impacts from the Tamiami Trail (the USGS is currently working with FDOT to initiate this effort), Phase 11 - identify locations for additional water conveyance structures (i.e., bridges, culverts), and Phase III - install additional water conveyance structures and upgrade existing structures, as appropriate. The project area is located on the Tamiami Trail between Collier-Seminole State Park - immediately south of the Miller Canal - to the west, and 50-Mile Bend to the east (approximately 65 km), The L-28 Levee Modification project will address the hydrological impacts of the Tamiami Trial from 50-Mile Bend to the eastern boundary of Big Cypress National Preserve (40-Mile Bend). The Modified Water Deliveries to Everglades National Park project will address the hydrological impacts of the Tamiami Trail east of 40-Mile Bend. The conveyance types and number of structures were derived, along with a cost estimate, after consultation between NPS, FDOT, USACE, and USGS, Costs of culverts and bridges, including installation were examined, and an estimate was agreed upon of approximately $500,000 for one (200-ft span) bridge or two (12-ft x 12-ft) box culverts, with 30 structures as a preliminary estimate of expected water conveyance structures to be installed. A more accurate number of conveyance structures will be available at the conclusion of the Phase I assessment.

RESTORATION BENEFITS: This project will improve the natural sheetflow of surface water within the watersheds of Ten Thousand Islands National Wildlife Refuge & Aquatic Preserve, Southern Golden Gate Estates, Fakahatchee Strand State Preserve, Big Cypress National Preserve, and Everglades National Park. By creating a more diffuse **flowway** beneath the Tamiami Trail, a **more** natural hydropattern will be established north and south of this highway. Improvement of the natural hydrology will also enhance biological restoration (i.e.. Cape Sable Sparrow habitat) for the region. This project will directly support objectives for several other south Florida Projects (i.e., Levee 28 Modification, Restoration of Southern Golden Gate Estates). In order for these projects to meet their respective design objectives, the additional water conveyance structures under the Tamiami Trail **will** need to be completed.

Time Line and Fiscal Year Budget (in thousands of dollars) for Additional Water Conveyance Structures Under

Tamiami Trail																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Phase I Scope of Work																
Hydrological Assessment																
Phase II																
Phase III																
Final Report																
Project																
		50	50	1900	5000	5000	3000									15,000
Subtotal																**$15,000**

TITLE: Seminole Tribe Water Conservation Project for the Big Cypress Reservation			
SUBREGION : 5	***PROJECT ID:*** SW03	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Infrastructure Investment		
PROJECT PLAN MANAGER: Tepper (954)966-630 X1120	***BASIS:*** 1	***TOTAL:*** $48,307,000	
LEAD ORGANIZATION(S): Seminole Tribe of Florida		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): USACE, NRCS, BIA			
COUNTY(S): Hendry, Broward		TOTAL: $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** SW14, TS85, TS86 SW15, SW03, SW05		***TOTAL:*** $48,307,000	
START: Jan 1998	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project includes design and construction of water control, management, and treatment facilities for all seven basins of the Big Cypress Reservation. The funding needs for this project total $48,203,000. Basins 1-4 of the Water Conservation Project have been submitted as a Critical Project under the procedures outlined by the USACE. This subset of the Water Conservation Project can be constructed and will function independently of the infrastructure required in Basins 5, 6 and 7 in the eastern potion of the Big Cypress Reservation and the BMP Project (BCB14-M). The Seminole Tribe is working with NRCS to design and construct the infrastructure for Basins 5, 6, and 7 in the Eastern portion of the Big Cypress Reservation and the BMP Project (BCB14-M).

RESTORATION BENEFITS: The planned network of surface water management structures is designed to accomplish the following four objectives:

(1) Remove phosphorus and other pollutants from water leaving the Reservation. The removal of these pollutants will be achieved using natural treatment processes, in pretreatment cells and water resource areas (WRA's). Unlike the stormwater treatment areas in the Everglades Construction Project, the Tribe's WRA's will take advantage of the natural treatment processes and will serve additional functions in the storage and conveyance of water.

(2) Convey and store irrigation water. To make use of water provided by the District (to replace the Tribe's diverted Compact water rights), the Tribe needs to be able to take this water, when it is available, to move it and to store it. This will be accomplished through water conveyance improvements and irrigation storage cells.

(3) Provide improved flood control. Stormwater must be controlled on the Reservation to prevent extended periods of flooding and limit impacts downstream. This will be accomplished by means of stormwater attenuation areas which will detain large storm events.

(4) Rewater Big Cypress National Preserve. The Seminole Water Conservation Project will provide the opportunity to restore more natural hydroperiods in the Big Cypress National Preserve. Bypass structures will be placed under the West Feeder Canal that will sheetflow clean water south along the length of the Feeder Canal into the Big Cypress Addition.

Time Line and Fiscal Year Budget (in thousands of dollars) for Seminole Tribe Water Conservation Project for the

Big Cypress Reservation																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Studies																
Dev& Constr.																
Project																
			Bas 1	Bas 2	Bas 3	Bas 4										
Seminole		500	4436	3690	2398	702										11,726
COE		500	4436	3690	2398	702										11,726
Seminole				514	434	2780										3,728
NRCS				2915	2460	15752										21,127
Subtotal		1000	8872	10809	7690	19936										**$48,307**

TITLE: Belle Meade Land Acquisition			
SUBREGION : 5	***PROJECT ID:*** SW04	***FINANCIAL REQUIREMENT:*** (proposed)	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	State: 50 percent Federal: 50 percent	
PROJECT PLAN MANAGER: Ilene Barnett 941-332-6975	***BASIS:*** 2	***TOTAL:*** $33,726,136 estimated	
LEAD ORGANIZATION(S): FDEP		***APPROPRIATED TO DATE:*** State: $10,916,425	
SUPPORTING ORGANIZATION(S): Big Cypress National Preserve			
COUNTY(S): Collier		***TOTAL:*** $10,916,425	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** SW10, SW09		Federal: State: ***TOTAL:*** $22,809,711	
START: 1997	***END:*** 1999	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This area of 17,987 acres, includes some of the most extensive examples of mature old-growth hydric pine flatwoods in southwest Florida not within other CARL projects. The hydrology of the hydric pine flatwoods and dwarf cypress communities within the project are relatively intact, as is the hydrology. Three archaeological sites have been recorded within the project boundaries, and additional sites may be present. The area is vulnerable to changes in the timing and amount of water flowing through it. Residential and commercial development spreading from Naples threaten it.

RESTORATION BENEFITS: The additional land would protect habitat for at least five FNAI Special Plants and a reported 23 Special Animals, including the Florida panther, red-cockaded woodpecker, and Florida black bear. The area is adjacent to the Save Our Everglades Golden Gate Estates project and would aid in protection of the primary watershed of the Rookery Bay National Estuarine Preserve. The project area also shares a 2-mile border with Collier-Seminole State Park. If acquired, Belle Meade will ultimately be an important part of a contiguous public conservation area extending across South Florida from the Gulf Coast to approximately 10 miles from the Atlantic Ocean. The project will provide a state forest with uses such as hiking, hunting, and nature appreciation. Use will be limited in the wet seasons.

Time Line and Fiscal Year Budget (in thousands of dollars) for Belle Meade Land Acquisition																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Appraisal																
Acquisition																
Project																
Subtotal																

TITLE: Big Cypress National Preserve Addition			
SUBREGION : 5	***PROJECT ID:*** SW05	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	State: $6,064,000 20 percent Federal: $24,256,000 80 percent	
PROJECT PLAN MANAGER: Hibbard 941-695-2000	***BASIS:*** 3	***TOTAL:*** $30,320,000	
LEAD ORGANIZATION(S): NPS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): FDOT/FDEP		State: *$8,900,000 Federal: $9,620,000	
COUNTY(S): Collier		***TOTAL:*** $18,520,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** TS17, TS06		***REMAINING FINANCIAL REQUIREMENT:*** State: 0 Federal: $11,800,000 ** ***TOTAL:*** $11,800,000 **	
START: 1998	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Public law 100-301 provided for expansion of the Preserve by 146,120 acres, of which approximately 32,154 acres will be transferred by the State of Florida. Of the total, 85,000 acres have been transferred from the Collier Companies as a result of the Florida/Arizona land exchange. The remaining private lands (27,000 acres) are to be acquired by the Federal Government. As of March 1997, approximately 10,896 acres remain to be acquired.

RESTORATION BENEFITS: The acquisition will preclude uses of the remaining private land tracts incompatible with the preservation, conservation, and restoration management objectives of the NPS. Public ownership will assure consistent land management throughout the watershed. These remaining private tracts effectively preclude full implementation of restoration plans of the Seminole Tribe of Florida, SFWMD, and the NPS. The tracts are scattered throughout wetlands critical to restoration of the natural hydrologic regime upstream of WCA-3A, Big Cypress National Preserve, and Everglades National Park.

***** The State of Florida has purchased the 32,154 acres at a cost of $8,900,000.

****** Some properties are "deferred " from acquisition (from willing sellers only). Approximately $8,000,000 will be needed to acquire these properties but is not programmed. This applies to both this project (BCB5-L), and (BCB-L).

Time Line and Fiscal Year Budget (in thousands of dollars) for Big Cypress National Land Acquisition																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Acquisition																
Project																
Acquisition		4000	2000	5800												11800
Subtotal																11800

TITLE: Big Cypress National Preserve Mineral Rights			
SUBREGION : 5	***PROJECT ID:*** SW06	***FINANCIAL REQUIREMENT:*** TBD	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	Federal 100 percent	
PROJECT PLAN MANAGER: Hibbard (941) 695-2000	***BASIS:*** 2	***TOTAL:*** unknown	
LEAD ORGANIZATION(S): NPS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S):			
COUNTY(S): Collier, Monroe & Dade		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** SW05, SW07		***TOTAL:*** Unknown	
START: On completion of determination of values	***END:***	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Acquire the value of and acquire non-Federal mineral rights on approximately 700,000 acres in Big Cypress Preserve. Until mineral interests are appraised, it is difficult to define the relative importance of acquisition to restoration of South Florida. In order to prevent potential harm, strict environmental standards need to be applied in the Preserve and throughout the ecosystem. This project would provide one additional safeguard to environmental integrity within the boundaries of the Preserve.

RESTORATION BENEFITS: Acquisition of all mineral interests would preclude surface disturbance associated with mineral exploration and development in relatively pristine wetlands.

Time Line and Fiscal Year Budget (in thousands of dollars) for Big Cypress National Preserve Mineral Rights																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Appraisal																
Acquisition																
Project																
Subtotal																

TITLE: Big Cypress National Preserve Private Inholdings			
SUBREGION : 5	***PROJECT ID:*** SW07	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	Federal 100 percent	
PROJECT PLAN MANAGER: Hibbard (941) 695-2000	***BASIS:*** 2	***TOTAL:*** $165,261,364	
LEAD ORGANIZATION(S): NPS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S):			
COUNTY(S): Collier, Monroe, & Dade		***TOTAL:*** $154,561,364	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** TS06, TS17, WCA1-I, SW05		***TOTAL:*** $10,700,000*	
START: Ongoing	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project consists of acquiring 180 privately owned tracts (597 acres) scattered throughout the original Preserve. Tracts average 3 acres in size with tracts ranging from less than 1 to over 250 acres. Several tracts involve businesses along U.S. Highway 41 and SR 29.

RESTORATION BENEFITS: Acquisition will allow the lands to be restored and managed consistent with the conservation mandates in the Big Cypress National Preserve enabling legislation (PL. 93-440, P.L. 100-301). Several of the tracts straddle surface water flow-ways (i.e. sloughs, strands) critical to sustaining natural hydropatterns. Private ownership of the scattered tracts precludes full implementation of ecological restoration and long-term management plans of the NPS.

***** Some properties are "deferred" from acquisition (from willing sellers only). Approximately $8,000,000 will be needed to acquire these properties but is not programmed. This applies to this project (BCB-7) and BCB-5L.

Time Line and Fiscal Year Budget (in thousands of dollars) for Big Cypress National Land Acquisition												
Task	95-97	98	99	00	01	02	03	04	05	06	Unprog	Total
Acquisition												
Project												
			1000	6000	3700							10700
Subtotal												

TITLE: Corkscrew Regional Ecosystem Watershed			
SUBREGION : 5	***PROJECT ID:*** SW08	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	Lee County: $10,000,000 FDEP: $11,400,000 SFWMD: $13,400,000	
PROJECT PLAN MANAGER: Chuck Rinaldi (561) 687-6537	***BASIS:*** 3	***TOTAL:*** $34,800,000	
LEAD ORGANIZATION(S): SFWMD		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): Lee County		Lee County: $10,000,000 FDEP: $7,000,000 SFWMD: $13,400,000	
COUNTY(S): Collier, Lee		***TOTAL:*** $30,400,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** SW12,SW13		***REMAINING FINANCIAL REQUIREMENT:*** Lee County: $0 FDEP: $4,400,000 SFWMD: $0 ***TOTAL:*** $4,400,000	
START: 1995	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The CREW covers nearly 55,968 acres in Lee and Collier counties and is located at the top of the western Big Cypress watershed. It conveys surface water to private, State, and federally protected natural areas, including Corkscrew Swamp Sanctuary, Florida Panther National Preserve, and the Everglades National Park. The area supports populations of at least two species of rare and endangered orchids and includes an unusual stand of dwarf bald cypress. Land management will be carried out by the SFWMD and the FGFWFC under contract with the SFWMD

RESTORATION BENEFITS: Hydologic restoration of the CREW restore and protect important habitat for the Florida Panther and the Florida Black bear and will protect the quality of water delivered to Corkscrew Swamp Sanctuary, Florida Panther National Preserve, ENP, and Estero Bay.

Time Line and Fiscal Year Budget (in thousands of dollars) for: Corkscrew Regional Ecosystem Watershed													
Task	95-97	98	99	00	01	02	03	04	05	06	07	Unprog	Total
Acquisition	23,400	7000	1500	500	1000	1400							34,800
Project													
Subtotal													$34,800

TITLE: Fakahatchee Strand Land Acquisition Project			
SUBREGION : 5	***PROJECT ID:*** SW09	***FINANCIAL REQUIREMENT:*** (proposed)	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	State: 50 percent match: $11,655447 Federal: 50 percent match: $11,655,447	
PROJECT PLAN MANAGER: Ilene Barnett (941) 332-6975	***BASIS:*** 2	***TOTAL:*** $23,310,945 (estimated)	
LEAD ORGANIZATION(S): FDEP		***APPROPRIATED TO DATE:*** State: $19,044,116	
SUPPORTING ORGANIZATION(S): Big Cypress National Preserve			
COUNTY(S): Collier		***TOTAL:*** $19,044,116	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** SW10, SW34		***TOTAL:*** $4,266,929	
START: 1997	***END:*** 1999	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Fakahatchee Strand is located in Collier County. Of the subtropical swamps in South Florida, Fakahatchee Strand is perhaps the most significant, being the richest in orchids and other rare tropical plants. It is the most critical to the survival of the Florida panther, and the most important for the mangrove swamps of the Ten Thousand Islands. The project area is probably the best example of the strand swamp found in the United States. It is linked hydrologically to the Everglades system and is important to the estuarine ecosystem of the Ten Thousand Islands.

The Strand has several archaeological sites and excellent potential for future archaeological investigations. It is threatened by unnatural patterns of water flow and unrestricted use in the private ownerships (several thousand). Acquisition started in 1972 through litigation and continued subsequently with EEL funds. The project is part of the Save Our Everglades initiative, with 5,815 acres remaining to be acquired.

RESTORATION BENEFITS: Completion of public acquisition efforts will help reduce the effects of unnatural patterns of water flow; help protect the largest concentration and the greatest diversity of native orchids in North America; and help protect several rare and endangered species, including the Florida panther.

Time Line and Fiscal Year Budget (in thousands of dollars) Fakahatchee Strand Land Acquisition Project																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Appraisal	■															
Acquisition		■	■	■												
Project																
Subtotal																**$23,310**

TITLE: Southern Golden Gate Estates Hydrologic Restoration			
SUBREGION : 05	***PROJECT ID:*** SW10	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition & Infrastructure	***BUDGET CATEGORY:*** WQ/Habitat Protection	Phase I Land Acquisition (Remaining)	$37,112,000
		Phase II Project, Design and Construction	$15,200,000
PROJECT PLAN MANAGER: Ed Kuester (850) 488-2351 Phase I Ananta Nath (941) 597-1505: phase II	***BASIS: 2***	***TOTAL:*** $52,312,000	
		APPROPRIATED TO DATE:	
		DEP:	$8,752,000
LEAD ORGANIZATION(S): FDEP , SFWMD, USACE		SFWMD (BCB):	$ 360,000
SUPPORTING ORGANIZATION(S): FDCA ,FDACS, and NRCS		WRDA	$ 0
COUNTY(S): Collier		***TOTAL:*** $9,112,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:**		Total Remaining Project Need	$43,200,000
Critical to:		WRDA Match at 50%	$21,600,000
		DEP:	$14,000,000
		SFWMD:	$ 7,600,000
Associated with:		***TOTAL:*** $52,312,000	
START: 1998	***END:*** 2005	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The primary objective of this project is to acquire land under public ownership and to implement structural measures to restore the ecology of the Southern Golden Gate Estates (SGGE). The SGGE encompasses an approximately 94 square mile area of sensitive environmental landscape in south central Collier County. It is an important surface water storage and aquifer recharge area with a unique ecology of cypress, wet prairie, pine and hardwood hammock and swamp communities, and includes three major flowways that contribute freshwater input to the Ten Thousand Island Estuary of the western Everglades watershed. The Faka Union Canal system, constructed in the 1960s to provide drainage for land development of approximately 173 square mile area, have overdrained the area resulting in reduction of aquifer storage, reduction of wetland functions invasion of upland vegetation, increased frequency of forest fires and increased fresh water discharges to the estuary. Variations of freshwater discharges at large amplitudes have resulted in large fluctuations of salinity level and have eliminated or displaced a high proportion of the benthic, midwater and fish plankton communities in the estuary.

Concern over the gradual degradation of environmental quality and water supply potential of the region prompted the State of Florida to include the area as a component of the Save Our Everglades (SOE) program in 1985. Subsequently, the project was included in the State's Conservation and Recreation Lands (CARL) Acquisition program initiative for acquiring the entire project area under public ownership. Out of a proposed 55,200 acres of land proposed for acquisition, the total area remaining to be acquired is 37,312 acres of which about 7,500 acres are controlled by approximately 4,200 landowners. There is a potential that these 7,500 acres can be acquired under one transaction. Active land acquisition is presently ongoing for the Fakahatchee Strand State Preserve adjacent on the east, and the Belle Meade CARL project to the west edge of the project. In 1996 the SFWMD developed a conceptual hydrologic restoration plan utilizing a continuous process hydrologic-hydraulic simulation model of the watershed. Five alternative restoration measures were evaluated. The structural elements of the most economic and environmentally sound plan consists of a combination of spreader channels, canal plugs, road removal and pump stations with a cost estimate of $11,652,769 in 1996 dollars. The implementation of the project is entirely contingent upon acquisition of lands. Once the land acquisition is complete, the project can be expected to be implemented without public controversy.

NOTE: The land acquisition component of this project was rated #4 on the Farm Bill Priority List.

RESTORATION BENEFITS: The implementation of the SGGE restoration plan would improve the water quality of the coastal estuaries by converting the voluminous freshwater point discharges to the traditional overland sheetflow along a six-mile wide front into the Ten Thousand Islands Estuaries Aquatic Preserve, part of the western Everglades. The reintroduction of overland flow through coastal marshes would increase marsh and mangrove productivity, moderate salinity fluctuations, provide a desirable mix of fresh and saline water

environment conducive to the survival and protection of juvenile fishes and shellfish beds, and would enhance the recreational and commercial fishery values of the region. Improved groundwater recharge will protect the City of Naples eastern Golden Gate wellfield, provide for a long term water supply source and serve as a natural barrier to a saltwater intrusion. Adjacent sensitive lands, including the Fakahatchee Strand State Preserve and the Florida Panther National Wildlife Refuge, will benefit from this plan with enhanced habitat quality. Existing level of flood protection for the Northern Golden Gate Estates will be maintained, and tremendous costs associated with providing drainage infrastructure to a poorly planned urban development on a wetland environment will be avoided.

Time Line and Fiscal Year Budget (in thousands of dollars) for Southern Golden Gate Estates Hydrologic Restoration

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Land Acquisition																
Engineering																
Project design																
Permitting																
Construction																
Final Report																
Project																
DEP	8752	3500	3500	3500	3500											22,152
SFWMD/BCD	360	125	100	150	1520	1420	1420	1420	1445							7,960
WRDA				7,895	8,000	1,420	1,420	1,420	1,445							21,600
Subtotal	9,112	3,625	3,600	11,545	13,020	2,840	2,840	2,840	2,890							**$52,312**

TITLE: Lands Adjacent to Dade County Training Jetport			
SUBREGION : 5	***PROJECT ID:*** SW11	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	May involve donation or swap.	
PROJECT PLAN MANAGER: Hibbard (941) 695-2000	***BASIS:*** 3	***TOTAL:***	
LEAD ORGANIZATION(S): NPS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): Dade County			
COUNTY(S): Collier, Dade		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** TS17, TS06, WCA1-I, SW07		***TOTAL:***	
START: Upon agreement	***END:***	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The Dade-Collier County Transition and Training Airport (jetport), an approximately 25,000-acre area within the boundary of Big Cypress National Preserve, is owned by Dade County. The property consists of approximately 24,000 acres of undisturbed wetlands, and 1,000 acres of wetlands that were dredged and filled for the development of the airport. The construction of the runway and associated taxi ways and facilities, has altered the hydrologic regime of the eastern Big Cypress Swamp. In 1970, the "Jetport Pact' between the United States and Dade County recognized that impacts of the airport on the Everglades Ecosystem. This pact called for the parties to acquire a suitable site for a regional airport and upon completion the Jetport would be abandoned.

RESTORATION BENEFITS: Acquisition of these lands would bring them under management of the NPS and thus eliminate any potential for the expansion of this airport. Having the lands under the management of the NPS would allow for land management practices such as prescribed fire and exotic vegetation control to occur. In addition the acquisition of this area would allow for the restoration of the area, thus eliminating the hydrologic impacts.

NOTE: There is the potential for transferring these lands, or at a minimum, the 24, 000 acres of undeveloped lands, to the NPS without the necessity of expending financial resources.

Time Line and Fiscal Year Budget (in thousands of dollars) for Lands Adjacent to Dade County Training Jetport																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Appraisal																
Acquisition																
Project																
Subtotal																

TITLE: Southern CREW Project Addition/Imperial River			
SUBREGION : 5	***PROJECT ID:*** SW12	***FINANCIAL REQUIREMENT:*** (proposed)	
PROGRAM CATEGORY: Land Acquisition& Infrastructure	***BUDGET CATEGORY:*** Land Acquisition & Infrastructure	Potential Co-sponsors: SFWMD, Lee County	
PROJECT PLAN MANAGER: Merriam (941)-338-2929	***BASIS:*** 2 Ecosystem Restoration	***TOTAL:*** $18,000,000	
LEAD ORGANIZATION(S): SFWMD, USACE		***APPROPRIATED TO DATE:*** SFWMD: $2,500,000	
SUPPORTING ORGANIZATION(S): Lee County			
COUNTY(S): Lee		***TOTAL:*** $2,500,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:**		Lee Co./ SFWMD $7,750,000	
Critical to:	CREW, Save our Rivers, Estero Bay Aquatic Preserve OFW	USACE: $ 7,750,000	
Associated with:	SW13, SW8	***TOTAL:*** $15,500,000	
START: 1997	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project will involve acquisition of 4,670 acres of land that, after restoration of historical hydrological flows, will be added to the Corkscrew Regional Ecosystem Watershed (CREW). The proposed project site is located in the southern Flint Pen Strand region of Lee County and the historical Imperial River flowway to Estero Bay. The lands proposed for acquisition have been divided into 5 and 10-acre tracts that are being actively developed as single family homes by the landowners of the 5 acre tracts. This project will involve purchase of lands in the impacted region before additional homes are constructed and hydrologic restoration of the impacted areas. Hydrologic restoration will include the following structural modifications: removal of existing road beds, single family homes, junk debris, fill material, agricultural canal and berms; placement of equalizer culverts; and replacement of undersized culverts and bridges. Undersized culverts and bridges are currently responsible for increasing the depth and duration of storm water over the lower Flint Pen Strand.

Acquisition of these lands soon is critical because of extreme development pressures in this area. Currently, the possibility exists for an additional 800 to 1000 single-family homes to be constructed in the area targeted for acquisition. This has been evident not only in new home starts during 1996, but also in the application for a DRI for the Parklands adjacent to the southern section of this proposed project. New residential development will involve construction of improved roads and other infrastructure that will further adversely impact the ecosystem, and increase the cost of subsequent acquisition/restoration. The roads and house pads associated with this type of development will block or alter the surface water flow and create adverse impacts to this environmentally sensitive area. Additionally, the cumulative impact of these homes will increase the depth and duration of streamflow which would increase the demand for flood intervention. During heavy rains in the summer of 1995, approximately 1700 people were evacuated from this project area and adjacent lands to the west. There is a great deal of pressure from the surrounding business community to develop a secondary levee system to provide additional flood protection to these home sites and allow continuation of single-family home development that would further impact the natural system. Based on past experience with areas such as the 8.5 Square Mile Area, it is clear that if the level of protection offered by this type of construction is not substantial; the homes ultimately flood and agencies are left with buy-out as the only option after homes have been constructed.

RESTORATION BENEFITS: This project will provide the following ecosystem restoration benefits: 1) preserve the natural water storage potential provided by the natural attributes of these lands; 2) re-establish historical flows across these lands currently impeded by roads and residential structures - this will avoid forcing more water eastward through the CREW Project and the Corkscrew Swamp Sanctuary which could harm natural wetlands by increasing hydroperiods in these areas; 3) restore the historical flowway of the Imperial River by removing structures and filled areas reducing the depth and duration of stormwater impacting natural areas; 4) reduce existing loads of nutrients and other pollutants to the Imperial River (e.g., septic, fertilizers, pesticides) and preclude the exacerbation of this pollution through increased development; and 5) preclude the development of another flood-prone residential development similar to the 8.5 Square Mile Area.

This acquisition not only mitigates future impacts, it becomes the ultimate solution for managing the prolonged health of a watershed of greater than 300 square miles. This project, coupled with proposed improvements to the Kehl Canal Weir, can reduce dry season flows (overdrainage) to the Imperial River by acting as a natural storage area. Restoring the historical flowway of the Imperial River will return some of the normal water levels within the environmental areas reducing impacts created by the manmade impoundments.

Time Line and Fiscal Year Budget (in thousands of dollars) for Southern CREW Project Addition/Imperial River																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Complete Engin Study																500
Permitting																100
Land Acquisition																14,000
Demolition /Restoration																3,400
Project																
	2500	3500	6000	3000	3000											18,000
Subtotal																**$18,000**

TITLE: Twelve Mile Slough			
SUBREGION : 5	***PROJECT ID:*** SW13	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition		
PROJECT PLAN MANAGER: Chuck Rinaldi (561) 687-6537	***BASIS:*** 3	***TOTAL:*** $3,300,000	
LEAD ORGANIZATION(S): SFWMD		***APPROPRIATED TO DATE:*** SFWMD $3,300,000	
SUPPORTING ORGANIZATION(S): Federal (Potential)			
COUNTY(S): Hendry		***TOTAL:*** $3,300,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** SW12, SW08		***TOTAL:*** $0	
START: 1998	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This site contains 3,300 acres in Hendry County and is tributary to the much larger and regionally significant Okaloacoochee Slough. It contains a mosaic of uplands and wetlands, as well as improved pasture areas which appear to be reverting to native range. Based on a 1993 FGFWFC report, this single-owner tract provides habitat for the endangered Florida Panther. Significant restoration on the site is necessary to correct overdrainage of the wetland communities.

RESTORATION BENEFITS: Restoration and protection is important because the Twelve Mile Slough is a headwater tributary to Okaloacoochee Slough, which supplies a major source of water for Fakahatchee Strand State Preserve and Big Cypress National Preserve. Surface water storage in the numerous wetlands provides for ground-water recharge of the underlying surficial aquifer and provides surface water supply to the Caloosahatchee River.

Time Line and Fiscal Year Budget (in thousands of dollars) for Twelve Mile Slough																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Acquisition																
Project																
Acquisition			3300													3300
Subtotal																**$3300**

TITLE: Seminole Tribe Best Management Practices for the Big Cypress Reservation			
SUBREGION : 5	***PROJECT ID:*** SW14	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Water Quality, Natural Resources Management	Seminole Tribe:	
PROJECT PLAN MANAGER: Tepper (954)966-6300X1120	***BASIS:*** **1**	***TOTAL:*** $4,779,000	
LEAD ORGANIZATION(S): Seminole Tribe of Florida		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): NRCS, ARS, IFAS/ES			
COUNTY(S): Hendry, Broward		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** SW03, TS86 TS85, SW05		***TOTAL:*** $4,779,000	
START: 6/96	***END:*** 12/99	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The Seminole Tribe has contracted with the NRCS to implement a comprehensive system of best management practices (BMP's) for all seven basins in the Big Cypress Reservation. Construction could be completed in 3 years starting in 1997. Enhanced water management will be accomplished through BMP's that include: conservation irrigation systems; nutrient loading reduction; application procedure training; fencing of WRA's and irrigation cells as detailed in the Water Conservation Plan; cross fencing for grazing management; livestock watering facilities; grazing management plans; closed-end irrigation systems; and a tail-water recovery system.

RESTORATION BENEFITS: The project will result in immediate, measurable improvements in the quality of water discharged to the Everglades Protection Area. It will also provide tangible improvement of the water quality leaving the Western Basins, an area not addressed completely by the Everglades Construction Project and the Everglades Forever Act. Although this project can be constructed and will function independently of the Water Conservation Project, the two will work best together to create the most benefit for the ecosystem.

Time Line and Fiscal Year Budget (in thousands of dollars) for Seminole Tribe BMP's for Big Cypress Reservation

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Devel. & Constr.																
Const. Mgt.																
Project																
Seminole Tribe		1843	2130	806												4,779
Subtotal																**$4,779**

TITLE: Seminole Tribe Exotic Species Removal			
SUBREGION : 2,5	***PROJECT ID:*** SW15	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Area Management	Seminole Tribe:	
PROJECT PLAN MANAGER: Tepper (954)966-6300X1120	***BASIS:*** 1	***TOTAL:*** $1,064,000	
LEAD ORGANIZATION(S): Seminole Tribe of Florida		***APPROPRIATED TO DATE:*** Seminole Tribe of Florida: $46,000 BIA: $30,000	
SUPPORTING ORGANIZATION(S): BCNP,BIA		***TOTAL:*** $76,000	
COUNTY(S): Hendry, Broward, Glades		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** SW05, TS11		***TOTAL:*** $988,000	
START: 1/1998	***END:*** 12/2010	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This program will eradicate and control exotic species, such as melaleuca and Brazilian pepper. An effort will be implemented to encourage growth of native species in appropriate vegetative communities on the Big Cypress and Brighton Reservation. The control of exotic and aquatic species, such as hydrilla, water hyacinth, and water lettuce on the Big Cypress and Brighton Reservation will be continued in order to maintain flows and facilitate the conveyance of the surface water management and conservation systems on the Reservations. The Tribe will also work in conjunction with the BCNP to control and eradicate exotic species along their common border.

RESTORATION BENEFITS: Exotic species, such as melaleuca and Brazilian pepper, occur in some of the degraded wetlands on the Big Cypress Reservation, adjacent to the Big Cypress National Preserve Addition, where natural hydropatterns have been disrupted. Controlling these exotics will result in reestablishment of native species and promote more beneficial wetland characteristics, including enhanced water quality functions and improved habitat for threatened and endangered species. The Brighton Reservation needs appropriate eradication and control to limit sources of exotic/aquatic vegetation being conveyed to Lake Okeechobee.

Time Line and Fiscal Year Budget (in thousands of dollars) for Seminole Tribe Exotic Species Removal

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
Seminole Tribe		46	46	46	46	46	46	46	46	46	46	46	46	46		598
BIA		30	30	30	30	30	30	30	30	30	30	30	30	30		390
Subtotal		76	76	76	76	76	76	76	76	76	76	76	76	76		**$988**

TITLE: Picayune Strand State Forest Exotic Species Management			
SUBREGION : 5	***PROJECT ID:*** SW16	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Natural Resources Management	FDEP $12,457,000 DOI $12,457,000	
PROJECT PLAN MANAGER: Folks (904) 414-9928	***BASIS:*** 3	***TOTAL:*** $24,914,000	
LEAD ORGANIZATION(S): FDACS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): FDEP, DOI			
COUNTY(S): Collier		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** SW04, SW09, SW10		FDEP $12,457,000 DOI $12,457,000 ***TOTAL:*** $24,914,000	
START: 1998	***END:*** 2010	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Ecosystem restorationactivities including the removal and control of approximately 18,500 acres of melaleuca and 3,400 acres of brazilian pepper. Also includes the use of prescribed burning on 20,000 acres per year and site preparation and replanting of almost 11,000 acres in areas destroyed by wildfire.

RESTORATION BENEFITS: This project will implement the control of everely invasive, exotic plant species. This will allow native species, including many threatened and endangered, more space to grow and thrive. In addition, the encouragement of native plant growth and the reforestation of these areas will provide more favorable habitat to threatened and endangered animals such as the Florida Panther. The regular use of prescribed burning will reduce the threat of wildfire, the loss of property, and help provide longterm control of exotics and maintenance of the fire-dependent natural communities.

Time Line and Fiscal Year Budget (in thousands of dollars) for Picayune Strand State Forest Exotic Species Management

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
FDEP																
DOI																
Project																
FDEP		277	1000	1000	1000	1250	1250	1250	1250	1250	1250	560	560	560		12,457
DOI		277	1000	1000	1000	1250	1250	1250	1250	1250	1250	560	560	560		12,457
Subtotal																**$24,914**

TITLE: Assimilative Capacity for Phosphorus of C&SF Canals on the Big Cypress Reservation			
SUBREGION : 5	***PROJECT ID:*** SW17	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research	Seminole Tribe:	
PROJECT PLAN MANAGER: Tepper (954)966-6300X1120	***BASIS:*** 2	***TOTAL:*** $550,000	
LEAD ORGANIZATION(S): Seminole Tribe of Florida		***APPROPRIATED TO DATE:*** NPS: $50,000 TOTAL: $50,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** TS08,SW03I,SW05 TS85, TS86		***REMAINING FINANCIAL REQUIREMENT:***	
		TOTAL: $500,000	
START: 1/1998	***END:*** 12/2004	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This research is required to determine the assimilative capacity of the plants and sediments of the C&SF Canals running through Big Cypress Reservation for the nutrient phosphorus. Data on the assimilative capacity will be useful in the general design of the Big Cypress Water Conservation Plan. The research would include sampling of sediments and vegetation, model simulation to assess assimilative capacity and analysis of historical data**.** The Tribe has used $50,000 from the NPS in FY 1997 and plans to use $50,000 from the FY 1998 CESI. The remaining $450,000 is needed through FY 2004.

RESTORATION BENEFITS: A better understanding of the assimilative capacity of the C & SF Canals conveying surface waters through the Big Cypress Reservation is a necessary component in the Seminole Tribe's comprehensive effort of reducing the high levels of phosphorus both entering and leaving the Big Cypress Reservation. This research will directly lead to a reduction in the amount of phosphorus discharged to the Everglades**.**

Time Line and Fiscal Year Budget (in thousands of dollars) forAssimilative Capacity for Phosphorus of C&SF Canals on the Big Cypress Reservation

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Design																
Permitting																
Implem.& Monit.																
Assessment																
Project																
Seminole Tribe NPS	50	50	190	50	40	40	80	50								550
Subtotal																**$550**

TITLE: Forested Wetland Nutrient Uptake Research			
SUBREGION : 5	***PROJECT ID:*** SW18	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research	Seminole Tribe:	
PROJECT PLAN MANAGER: Tepper (954)966-6300X1120	***BASIS:*** 2	***TOTAL:*** $470,000	
LEAD ORGANIZATION(S): Seminole Tribe of Florida		***APPROPRIATED TO DATE:*** NPS: $100,000	
SUPPORTING ORGANIZATION(S): EPA, BIA, SFWMD, NPS, USACE, DOI			
COUNTY(S): Hendry, Broward		***TOTAL:*** $100,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** SW03, TS08, TS85, TS86,SW05		***REMAINING FINANCIAL REQUIREMENT:***	
START: 1/1998	***END:*** 12/2004	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This research would analyze the level at which forested wetland, e.g. Cypress forest, can fix nutrients without causing any adverse effects on the natural wetland functions of the native flora and fauna. Because no data exists on the question of nutrient uptakes in forested (as opposed to sawgrass) wetlands, this research is critical in order to determine the effective loading levels for such wetland systems used for the restoration. The Tribe's Water Conservation Plan for the Big Cypress will use forested wetlands to treat nutrient laden water for release to the Everglades system. The Tribe's design may be applicable in other areas as well.
This research should begin during FY 1998; the Tribe plans to use $100,000 of the funds provided through the National Parks Service (NPS) Critical Ecosystem Studies Initiatives (CESI) funding. Therefore, the funding requested in FY 1999 would provide the second year funding. Total funding needs for the completion of the research are estimated to be $470,000. The funding needs remaining after FY 1999 total $260,000 for FY 2000 through 2004.

RESTORATION BENEFITS: A thorough understanding of the optimization of nutrient removal from Cypress or forested wetlands will be critical in determining how effective these wetland systems will be in accomplishing restoration goals. This information will be essential both in the Tribe's Surface Water Conservation System on the Big Cypress Reservation and other restoration efforts (STAs).

Time Line and Fiscal Year Budget (in thousands of dollars) for Nutrient Threshold Work for Cypress

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Design		■														
Permitting			■													
Implem.& Monit.			■	■	■	■	■									
Assessment				■	■	■	■									
Project																
Seminole Tribe			110	60	30	30	30	70								430
NPS		100														
Subtotal																**$430**

TITLE: Impacts of Sludge Deposition on Phosphorus Levels on the Big Cypress Reservation			
SUBREGION : 5	***PROJECT ID:*** SW19	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research	NPS: $50,000	
PROJECT PLAN MANAGER: Tepper (954)966-6300X1120	***BASIS:*** 2	***TOTAL:*** $50,000	
LEAD ORGANIZATION(S): Seminole Tribe of Florida		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): ARS, BIA, NRCS, BCNP/NPS, USGS, SFWMD			
COUNTY(S): Hendry, Broward		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** TS08		***TOTAL:*** $50,000	
START: 1/1998	***END:*** 12/1998	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The Big Cypress Reservation has experienced high levels of phosphorus loading from the canals entering the Reservation from the north where sludge has historically been deposited as a means of disposal and fertilization. Studies are needed to determine if the sludge deposition is related to the high levels of phosphorus.

RESTORATION BENEFITS: Understanding the implications of sludge deposition on lands in or adjacent to nutrient sensitive areas will lead to appropriate regulation of these practices, eventually leading to a reduction of the amount of phosphorus entering the Big Cypress Reservation and discharged to the Everglades.

Time Line and Fiscal Year Budget (in thousands of dollars) for Impacts of Sludge Deposition on Phosphorus Levels on the Big Cypress Reservation

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Data Assessment																
Project																
NPS		50														50
Subtotal																**$50**

TITLE: Melaleuca Control (Critical) on Big Cypress National Preserve			
SUBREGION : 05	***PROJECT ID:*** SW20	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Natural Resource Management		
PROJECT PLAN MANAGER: Hibbard (941) 695-2000	***BASIS:*** 3	***TOTAL:*** $1,400,000	
LEAD ORGANIZATION(S): NPS		***APPROPRIATED TO DATE:*** Dade County $700,000	
SUPPORTING ORGANIZATION(S): Dade County			
COUNTY(S): Collier, Dade, Monroe		***TOTAL:*** $700,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $700,000	
START: 1998	***END:*** 2005	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The spread of invasive exotic plants is producing profound environmental consequences in the Big Cypress /Everglades ecosystem. Invasive exotic plants are "out competing" native plants and altering topography and soils at an alarming rate. *Melaleuca quinquenervia,* an introduction from Australia, is regarded as the most serious threat to the integrity of the Big Cypress/Everglades ecosystem. Melaleuca currently infests more than 150 square miles of fragile Big Cypress wetlands.

An existing memorandum of agreement between Big Cypress National Preserve and Metropolitan Dade county provides for the development and implementation of a mitigation plan to satisfy the permitting requirements for a joint Dade County/Florida Department of Corrections jail facility. This mitigation plan will provide for the treatment of all melaleuca on 20,000 acres in the vicinity of Monroe Station.

Increased funding will enable BCNP to treat an additional 14,000 acres of adjacent melaleuca. This plan will provide for the treatment, re-treatment and subsequent monitoring and evaluation.

RESTORATION BENEFITS: The removal of melaleuca from sensitive BCNP wetlands will permit the re-establishment of native plant communities. This project is of greater ecosystem benefit in that it is compatible and compliments other agency efforts for melaleuca eradication.

Time Line and Fiscal Year Budget (in thousands of dollars) for Melaleuca Control (Critical)

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Treatment		■	■													
Re-Treatment				■	■											
Monitoring					■	■	■	■	■							
Project																
		450	450	150	150	50	50	50	50							1,400
Subtotal																**$1,400**

TITLE: Subsurface Sand Body Investigation (Sunniland)			
SUBREGION : 5	***PROJECT ID:*** SW22	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: **Science**	***BUDGET CATEGORY:*** Research		
PROJECT PLAN MANAGER: **Scott DEP (904)488-9380**	***BASIS:*** **1**	***TOTAL:*** $10,000	
LEAD ORGANIZATION(S): FDEP, UM/RSMAS, SFWMD		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S):			
COUNTY(S): Collier		***TOTAL:*** $10,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** TS03, TS41		***TOTAL:*** 0	
START: 1996	***END:*** 1997	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project was designed to provide core samples from the sediments occurring up to 800 feet below the land surface in the updip portion of the sand body suspected to provide ground water to Florida Bay. This core was completed during the Spring, 1997, at a total depth of approx. 800 feet in the carbonate sediments that underlie the siliciclastic (sands, silts and clays) of the "River of Sand." Analysis of the sediments is ongoing at UM/RSMAS.

RESTORATION BENEFITS: In order to determine the possibility of the siliciclastic unit providing ground water into Florida Bay and the subsequent effects on the ecosystem, the lithostratigraphic and hydrostratigraphic framework of these sediments needs to be better understood.

Time Line and Fiscal Year Budget (in thousands of dollars) for Subsurface Sand Body Investigation (Sunniland																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Drilling core samples																
Project																
State	$10															$10
Subtotal																**$10**

TITLE: Southwest Surficial Aquifer System Investigation			
SUBREGION : 5	***PROJECT ID:*** SW23	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research		
PROJECT PLAN MANAGER: Scott (904) 488-9380	***BASIS:*** 3	***TOTAL:*** $60,000	
LEAD ORGANIZATION(S): USGS, FDEP		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): SFWMD			
COUNTY(S): Collier		***TOTAL:*** $60,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** TS41		***TOTAL:*** $0	
START: July, 1997	***END:*** June, 1998	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Characterization of sediments of the surficial aquifer system, and potential function of the aquifer in the subregion's ecology. The project timeline has been extended into 1998.

RESTORATION BENEFITS: Obtain an understanding of geological and hydrological relationships between groundwater and other water resources of the Big Cypress Basin.

Time Line and Fiscal Year Budget (in thousands of dollars) for																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
State	20	40														60
Subtotal																**$60**

TITLE: Henderson Creek/Belle Meade Restoration Project			
SUBREGION : 5	***PROJECT ID:*** SW24	***FINANCIAL REQUIREMENT:*** (proposed)	
PROGRAM CATEGORY Infrastructure	***BUDGET CATEGORY:*** Infra Invest, WQ/Habitat Protect Natural Resource Man	WRDA: $1,200,000 State: $2,610,000 County: $380,000 USFWS: $950,000	
PROJECT PLAN MANAGER: Haner (941) 417-6310	***BASIS:*** 2	***TOTAL:*** $5,140,000	
LEAD ORGANIZATION(S): FDEP		***APPROPRIATED TO DATE:*** County: $380,000 State: $2,610,000 **USFWS:** $950,000 ***TOTAL:*** $3,940,000	
SUPPORTING ORGANIZATION(S): SFWMD/Collier County /USFWS			
COUNTY(S): Collier		***REMAINING FINANCIAL REQUIREMENT:*** WRDA: $1,200,000 State: 0 County: 0 USFWS: 0 ***TOTAL:*** $1,200,000.00	
LINKED PROJECTS: **Dependent on:** **Critical to:** Rookery Bay Aquatic Preserve and National Estuarine Research Reserve **Associated with:**			
START: 1997	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Collier County is currently facing unprecedented urban growth rates, with Naples leading the nation in metropolitan growth. Changes in land use within the primary watersheds draining into Rookery Bay have been identified in the Rookery Bay National Estuarine Research Reserve management plan as the highest priority resource issue that threatens the long term preservation of the research reserve's Estuarine resources. This project will return a portion of the historic timing, duration and volume of freshwater inflow, as well as providing much needed treatment of stormwater, into Rookery Bay.

Land acquisition for placement of culverts under SR 951, restoration of sheetflow, habitat preservation and exotic vegetation removal: Four additional culverts under this road (4 are currently existing and at times, overloaded), are proposed to restore historic surface water flows into the estuary, and alleviate some upstream flooding problems. Lands have been and are currently in the process of being purchased by DEP to allow this work, and a portion of the exotic vegetation removal/habitat enhancement is beginning within the next two months.

Henderson Creek Filter Marsh and Land Acquisition: The purchase of 25 acres (CARL) adjacent to Henderson Creek, and conversion to a filter marsh water management system by regrading of lands, upgrading the weir structure, and coordinating with the SFWMD, will assist in treating the stormwater flowing from the upstream canal prior to discharge into the estuary. Ten acres have recently been purchased and the remaining portion is pending purchase.

Manatee Basin Hydrologic Restoration: Purchase of 100 acres of land by State and County adjacent to the Manatee Basin, a natural upwelling area at the headwaters of the south fork of Henderson Creek, and restoration of sheet flows and stormwater treatment by adding culverts, filling ditches, roadbed removal, exotic removal, and berm creation to prevent downstream flooding of private property. The County is in the process of purchasing a 70 acre parcel and will be donating that to the State, and the State will be purchasing the remainder of the area.

Swale and Spreader Systems: Two swale and spreader systems are proposed from US 41 canal into McIlvane Marsh, which will enhance water quality, quantity, timing, and distribution of freshwater into the marsh. Engineered plans are complete at this point for this project.

Road to Nowhere Roadbed Removal: Removal of this old roadbed, or portions thereof, will restore historic sheetflow into McIlvane Marsh. The area is currently being used by a breeding population of endangered American crocodiles. Work will be coordinated with GFC to assure no adverse impact to the crocodiles.

RESTORATION BENEFITS: Immediate restoration of historic sheetflow into the estuary, treatment of stormwater, improvements to water quality, increased habitat value and wetland functions.

Time Line and Fiscal Year Budget (in thousands of dollars) for Henderson Creek/Belle Meade Restoration Project																
Task	94-97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
SR 951 Culverts	2000	190	190													2,380
Filter Marsh and Land Acquisition	286	400	400	172	172											1,430
Manatee Basin Hydro Restoration		360	85	250	250											945
Spreader Systems	20	65	150	50												285
Road Removal			100													100
Subtotal	2306	1015	925	472	422											$5,140

TITLE: Lake Trafford Restoration			
SUBREGION : 5	***PROJECT ID*** SW26	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management /Infrastructure	***BUDGET CATEGORY:*** Water Quality, Habitat Protection, Natural Resource Mngt.	Phase I - Permitting an/sampling - $143,000 Phase II - Pre-dredging Construction - $100,000 Phase III - $7,000,000 Phase IV - $1,000,000	
PROJECT PLAN MANAGER: Barnett (941) 332-6975	***BASIS:*** 2	***TOTAL:*** $ 8,243,000	
		APPROPRIATED TO DATE:	
LEAD ORGANIZATION(S): FGFWFC/SFWMD/ Collier County/DEP		FGFWFC: $14,000, Collier CO.: 26,000	
SUPPORTING ORGANIZATION(S): IFAS/NRCS/National Audubon Society/FDACS/Immokalee Chamber of Commerce /USGS		DEP: 3,000	
COUNTY(S): Collier		***TOTAL:*** $43,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		Collier County/ SFWMD/ FGFWFC/ FDEP/ IFAS/ USGS/ NRCS/FDACS/other potential partners: 50% - $4,100,000 ***TOTAL:*** $8,200,000	
START: 1998	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Lake Trafford is the largest lake south of Lake Okeechobee (1,494 acres) and is located roughly three miles west of the City of Immokalee. The lake is the headwaters of the Corkscrew Swamp Sanctuary and CREW to the west-southwest and the Fakahatchee Strand system including Camp Keais Strand and the Florida Panther National Wildlife Refuge to the south.

Approximately 7 million cubic yards of unconsolidated muck on the bottom of the lake was created in the 1970s after herbiciding a hydrilla bloom. During storm events, the sediments are disturbed causing an increase in suspended solids, dissolved nutrients and BOD. Loss of water clarity, unconsolidated sediments and low DO has resulted in a decimated fishery.

A multi-agency task force has evaluated the project and determined that a one - time dredge event would restore the lake. Sediment analysis has found that the spoil material is suitable for disposal on farmland. Additionally, long term management of the lake and surrounding lands will assure continued benefits of the restoration. The long-range plan includes restoration of native aquatic plant communities to enhance habitat for fish and wildlife populations, control of nonpoint source pollution through BMPs, and development of a long-term management plan to ensure that the benefits of the project are maintained through time. Components of the project will include (1) physical and biological assessment of the lake and watershed, (2) development of restoration needs and options, (3) selection of initial restoration strategy in cooperation with all stakeholders, (4) design of restoration engineering and biological components (5) development of management programs for adjacent homeowners, landowners, fishermen, and other lake users (6) implementation of a first-generation restoration and real-time modeling/management program for the lake and adjacent lands, (7) assessment of restoration results, (8) revision of restoration strategies and designs, (9) implementation of the second-generation restoration strategies, and (10) implementation of on-going management programs.

RESTORATION BENEFITS: The objective of this project is to restore water quality and habitat functions of Lake Trafford. Removal of the muck to farmland will immediately improve lake quality and enhance farmland productivity. Reoccurance of the muck layer is unlikely due to improved aquatic plant control methods. Furthermore, surrounding agricultural development have committed to using BMPs to reduce pollutant loading into the lake, to allow for a long-term improvement to the lake habitat. The lake provides recreational fishing activities and supports a tourism industry for an economically depressed region. Restoration of the Lake would be consistent with the Governor's Commission for a Sustainable South Florida recommendations for quality and sustainable communities.

Time Line and Fiscal Year Budget (in thousands of dollars) for Lake Trafford Restoration																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Permit Sampling and Engineering	43	100														143
Predredging earthwork		50	50													100
Dredging			4000	3000												7,000
Long range management		200	200	200	200	200										1,000
Subtotal																**$8,243**

TITLE: Estero Bay Land Acquisition Program			
SUBREGION : 5	***PROJECT ID:*** SW28	***FINANCIAL REQUIREMENT:*** State	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition		
PROJECT PLAN MANAGER: Ilene Barnett (941) 332-6975	***BASIS:*** 3	***TOTAL:*** $20,784,050 (estimated)	
LEAD ORGANIZATION(S): FDEP		***APPROPRIATED TO DATE:*** State $7,973,750	
SUPPORTING ORGANIZATION(S): USFWS, The Nature Conservancy			
COUNTY(S): Lee		***TOTAL:*** $7,973,750	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** SW35		***TOTAL:*** $12,810,300	
START: 1985	***END:*** Completion of acquisition	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Much of the Estero Bay Project is comprised of wetlands fronting Estero Bay (mangrove swamp, salt marsh, and salt flats). These communities provide nutrients to the Bay, contributing substantially to its biological productivity. The Bay, one of the most productive estuaries in the State, supports a diversity of wildlife, including the federally endangered bald eagle. These communities provide an important nutrient for the Bay, thus contributing to biological productivity. The wetlands are in a natural condition and help maintain high quality of water in the Estero Bay Aquatic Preserve. The project also includes the largest remaining block of rosemary scrub in southwest Florida. Several archaeological sites attributed to the Calusa Indians and their prehistoric ancestors are known to be within the project area. The project is threatened by the rapid residential development in the area.

RESTORATION BENEFITS: The area will be managed as a buffer preserve. Because the wetlands still are in a natural condition, the project will protect the Bay's high-quality water and the area's native plants and animals and archaeological sites. Additionally, it will provide recreational opportunities to the people of the rapidly growing Fort Myers area.

Time Line and Fiscal Year Budget (in thousands of dollars) for Estero Bay Land Acquisition Project																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Appraisal	■															
Acquisition		■	■	■												
Project																
Subtotal																

TITLE: Lakes Park Restoration Project			
SUBREGION : 5	***PROJECT ID:*** SW29	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Water Quality/ Habitat Protection, Natural Resources Mngt.	County/private $2,541,000 WRDA: $2,459,000	
PROJECT PLAN MANAGER: Ilene Barnett (941) 332-6975	***BASIS:*** 2	***TOTAL:*** $5,000,000	
LEAD ORGANIZATION(S): Lee County/Private		***APPROPRIATED TO DATE:*** Lee County: $2,391,000 FDEP: $150,000	
SUPPORTING ORGANIZATION(S): FDEP/SFWMD		***TOTAL:*** $2,541,000	
COUNTY(S): Lee		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		WRDA 50 %: $2,459,000 Lee County: $0 ***TOTAL:*** $2,459,000	
START: 1997	***END:*** 2003	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Lee County Lakes Regional Park is owned and managed by Lee County for conservation and recreational purposes. The project consists of a public/private effort to construct a 40-acre marsh/flow-way in an abandoned rock mine to improve present habitat conditions and water quality trends discharging to Hendry Creek and Estero Bay. Lee County is attempting to secure necessary funds for construction, Private contributions include land donations for project expansion and funding for long-term maintenance.

RESTORATION BENEFITS: The project is expected to enhance surface water runoff quality by creating a meandering flow-way with shallow littoral zones, removing aquatic and upland exotic infestation while allowing public access into upland areas of improved native habitat.

The project will remove exotic vegetation and replant native vegetation on 11 acres of uplands and 9 acres of littoral zone. The creation of a filter marsh and connection of the islands to form a meandering flow-way will increase residence time of the surface water and enhance pollution removal and oxygen content. The systems should adequately treat the inflow from the existing watershed of approximately 2,560 acres with the potential to accept additional flow diverted from other watersheds. The restoration will provide immediate habitat and water quality benefits at Lakes Park and improve downstream conditions in Hendry County and the Estero Bay Aquatic Preserve.

Time Line and Fiscal Year Budget (in thousands of dollars) for Lakes Park Restoration Project

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Pollutant calcs	■															50
Exotic removal	■															50
Finalize Plans	■															50
Earthwork		■	■	■	■	■										3,900
Maintenance																50
Project																
																5,000
Subtotal																$5,000

TITLE: Town of Ft. Myers Beach Stormwater Retrofit Project			
SUBREGION : 5	***PROJECT ID:*** SW30	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Water Quality, Habitat Protection, Infras Investmnt		
PROJECT PLAN MANAGER: Ilene Barnett (941) 332-6975,	***BASIS:*** 2	***TOTAL:*** $120,000	
		APPROPRIATED TO DATE: (Conversion of 48,000 square feet of asphalt to pavers, completed, $177,000.)	
LEAD ORGANIZATION(S): Town of Ft. Myers Beach			
SUPPORTING ORGANIZATION(S): FDEP, SFWMD, Charlotte Harbor NEP		***TOTAL:*** $0	
COUNTY(S): Lee		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		Possible grants from FDEP, SFWMD, and Charlotte Harbor NEP $60,000 and WRDA 50% match - $60,000 ***TOTAL:*** $120,000	
START: 1998	***END:*** 2000	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The newly incorporated (1/95) Town of Ft. Myers Beach has identified that the protection of Estero Bay and the local beaches requires the management of pollutants carried by stormwater runoff from the island. Because the majority of the Town is already urbanized with no stormwater management system in place, the town is beginning the environmental enhancement and restoration process by identifying stormwater hot spots through an inventory and sampling, reducing non-stormwater discharges by inspection, and highlighting urban rehabilitation through one or more retrofit projects. The town has already converted 48,000-sq. ft. of asphalt to pervious pavers at cost of $177,000. Specific project components are as follows: Inventory of stormwater system, sediment sampling, illicit connection screening, and implementation of urban retrofit project.

This project is strictly for environmental enhancement of Estero Bay with full support of local government and citizens. There is no drainage or flood control component. There is no other alternative for stormwater treatment, such as filter marsh creation, due to lack of space.

RESTORATION BENEFITS: This project will have immediate water quality and ecological benefits to Estero Bay Aquatic Preserve (ranked 6th on the CARL list) by reducing pollutant loading into the bay.

Time Line and Fiscal Year Budget (in thousands of dollars) for Town of Ft. Myers Beach Stormwater Retrofit Project

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Inventory of																
Stormwater Sys																20
Sediment Sample																18
Illicit screening																7
Retrofit project																75
Project																
		20	60	50												120
Subtotal																$120

TITLE: Rookery Bay Land Acquisition Project			
SUBREGION : 5	***PROJECT ID:*** SW31	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	State 100 percent	
PROJECT PLAN MANAGER: Ilene Barnett (941) 332-6975	***BASIS:*** 3	***TOTAL:*** $38,826,750 (estimated)	
LEAD ORGANIZATION(S): FDEP		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S):		State	
COUNTY(S): Collier		***TOTAL:*** $31,355,418	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** SW04		State ***TOTAL:*** $7,471,332	
START: 1997	***END:*** 1998	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project consists of 12,006 acres in Collier County and provides an outstanding example of a subtropical estuarine system. Its mangroves shelter important nesting colonies of water birds, and feed and protect many aquatic animals, which are the foundation of a commercial and sport fishery. The natural communities associated with the estuary are relatively undisturbed and range from mangrove and marsh to flatwoods and maritime hammock. As part of the national estuarine research reserve system, Rookery Bay is representative of the West Indian biogeographic type. The area is believed to have good potential for archaeological investigations. The area is threatened by dredging and filling associated with the rapid development of the area.

RESTORATION BENEFITS: Acquisition will protect the Bay's water quality and its native plants and animals and will provide recreational opportunities to the people of southwest Florida. Additionally, the project will further coastal ecosystem research and environmental education.

Time Line and Fiscal Year Budget (in thousands of dollars) *:* Rookery Bay Land Acquisition Project																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Appraisal																
Acquisition																
Project																
Subtotal																

TITLE: Collier-Seminole State Park Exotic Removal/land Acquisition Project (Critical)			
SUBREGION : 05	***PROJECT ID:*** SW33	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management/acquisition	***BUDGET CATEGORY:*** Natural Resource Management/habitat protection	WRDA $404,000 DEP $404,000	
PROJECT PLAN MANAGER: Bob Henry (941) 394-3397	***BASIS:*** 3	***TOTAL:*** $808,000	
LEAD ORGANIZATION(S): DEP		***APPROPRIATED TO DATE:*** DEP: $404,000	
SUPPORTING ORGANIZATION(S):			
COUNTY(S): Collier		***TOTAL:*** $404,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** SW34,SW24, SW04, SW16		DEP: $0 WRDA: $404,000 ***TOTAL:*** $404,000	
START: 1998	***END:*** 2000	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Collier-Seminole State Park, a 6,423 acre unit, is part of the Everglades system. Its attributes include tropical hammock, cypress swamp, freshwater marsh, and the Blackwater River which flows through a mangrove swamp. The property is linked hydrologically and geographically to the Rookery Bay and Cape Haze/10,000 Islands Aquatic Preserves and to Belle Meade, Southern Golden Gate Estates and Picayune Strand State Forest, and Fakahatchee Strand. The park features tropical and temperate plants and animals mixing together, as do fresh and salt water. Sandy soil is present with deep mucky organic soil. Life is held together here in a delicate balance. Twelve different natural communities have been mapped and described, and are intermixed in the park in a mosaic of habitat types. Among them is the finest remaining tropical hardwood hammock on the west coast of Florida, noted for its stand of native royal palms.

Exotic plant species threaten the existence of this rich resource. Melaleuca trees and Brazilian pepper can eventually crowd out native species, creating a monoculture of the exotic species. The Park Service continues to control infestation by exotic plants; however, the control aspect of the exotic problem is hampered by forced reductions on the Service over the last 8 years. The hope is that be contracting exotic removal on a large scale, and continued maintenance by the Park Service as part of its routine management, the problem can be solved.

Urban development is also rapidly approaching Collier-Seminole State Park. Property adjacent to the park is commercially valuable and is highly vulnerable to intensive development. This proposal also seeks funds to acquire additional buffering lands around the park.

RESTORATION BENEFITS: Additional funds will enable the DEP Florida Park Service to make greater strides against exotic plants' serious encroachment on the native communities of the park. **Approval of this project will ensure the complete eradication of melaleuca from Collier-Seminole State Park.**

Further land acquisition will exclude commercial development from inholdings in the park and provide a buffer against development to the north. It will also ensure the integrity of surface water flow and help to create a natural corridor between Collier-Seminole State Park and Fakahatchee Strand State Preserve.

Time Line and Fiscal Year Budget (in thousands of dollars) for Collier-Seminole State Park Exotic Removal/Land Acquisition Project (Critical)

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Exotic's removal and retreatment		54	54													108
Land Acquisition		350	175	175												700
Subtotal		404	229	175												**$808**

TITLE: Fakahatchee Strand State Preserve Exotic Removal Project (Critical)			
SUBREGION : 05	***PROJECT ID:*** SW34	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Natural Resource Management		
PROJECT PLAN MANAGER: Greg Toppin (941) 695-4593	***BASIS:*** 3	***TOTAL:*** $200,000	
LEAD ORGANIZATION(S): DEP		***APPROPRIATED TO DATE:*** approx DEP: . $5,000/yr. for maintenance	
SUPPORTING ORGANIZATION(S):			
COUNTY(S): Collier		***TOTAL:*** 0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** SW09		DEP: $100,000 WRDA: $100,000 ***TOTAL:*** $200,000	
START: 1998	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Invasion by exotic plants is a severe threat to the natural biota of Fakahatchee Strand State Preserve. The 66,997 acre preserve contains a rich assemblage of plants and animals, **boasting the greatest biological diversity of any swamp community in the United States.** Fakahatchee Strand is noted for an abundance of imperiled plant and wildlife species, including the Florida Panther. The preserve is hydrologically important as its waters flow into Everglades National Park, nourishing the Ten Thousand Islands' estuarine ecosystem.

Fakahatchee Strand State Preserve continues to control and monitor exotic plant infestations as part of its ongoing activities. Currently, there is a 75 acre tract of Melaleuca monoculture which requires additional funds to remove, as well as an unspecified acreage of Brazilian pepper. Once the initial removal and follow-up treatments occur, ongoing management activities will assure that re-infestation does not occur.

RESTORATION BENEFITS: The removal of melaleuca and Brazilian pepper from the Fakahatchee Strand wetlands will permit the re-establishment of native plant communities. This project is of greater ecosystem benefit in that it is compatible and compliments other agency efforts for melaleuca and other exotic pest plant eradication.

Time Line and Fiscal Year Budget (in thousands of dollars) for Fakahatchee Strand State Preserve Exotic Removal Project (Critical)

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
exotic removal and retreatment		50	50	50	50											200
Subtotal																**$200**

TITLE: Estero Bay Aquatic Preserve and Buffer Preserve Enhancement and Exotic Removal Project			
SUBREGION : 05	***PROJECT ID:*** SW35	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management/acquisition	***BUDGET CATEGORY:*** Natural Resource Management/habitat protection	WRDA $682,500 DEP $682,500	
PROJECT PLAN MANAGER: Heather Stafford (941) 463-3240	***BASIS:*** 3	***TOTAL:*** **$1,365,000**	
LEAD ORGANIZATION(S): DEP		***APPROPRIATED TO DATE:*** DEP: $35,892	
SUPPORTING ORGANIZATION(S):		***TOTAL:***	
COUNTY(S): Collier		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** SW28		DEP: $646,608 CARL match WRDA: $682,5 00 ***TOTAL:*** ***$1,329,108***	
START: 1998	***END:*** 2004	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION:

I. Melaleuca removal: Removal, treatment, monitoring, and follow-up treatment of 450 acres of Melaleuca within the 5,494 acre Estero Bay State Buffer Preserve.

II. Dog Key Exotic Removal: Removal, treatment, monitoring, and follow-up treatment of exotic vegetation on Dog Key, a 40 acre island within the Estero Bay Aquatic Preserve and part of the Estero Bay State Buffer Preserve with documented Calusa Indian middens/mounds.

RESTORATION BENEFITS:

Removal of stands of Melaleuca in the buffer preserve will allow the return of natural functioning of an ecosystem comosed of pine flatwood, salt marsh, salt flats, and mangroves, and regaining pre-infestation condition of water and nutrient flow to the Estero Bay Aquatic Presrve. The exotic removal and control program on Dog Key will allow the area to regain its native plant communities on this culturally and historically important site.

Time Line and Fiscal Year Budget (in thousands of dollars) for Estero Bay Aquatic Preserve and Buffer Preserve Enhancement and Exotic Removal Project

Task	97	98	99	00	01	02	03	04	05	06	Unprog	Total
DogKey Exotic Removal monitoring and follow-up		9	3	3			`					15
Land Acquisition in Buffer Reserve		639										639
Exotic Removal in Buffer Reserve		36	135	135	135	135	135	135				711
Subtotal												**$1,365**

TITLE: Long-term Study of Fire Regimes in Pineland and Associated Cypress Wetland			
SUBREGION : 3,5,6	***PROJECT ID:*** SW36	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research		
PROJECT PLAN MANAGER: James R. Snyder	***BASIS:***	***TOTAL:*** $660,000	
LEAD ORGANIZATION(S): USGS/BRD, NPS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S):			
COUNTY(S): Collier, Dade, Monroe		**TOTAL:** $141,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $519,000	
START: 1994	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Most of the natural areas in south Florida, including >4,000 km^2 managed by the U.S. Department of the Interior, require fire for long-term maintenance. This study is designed to determine the response of pine forest vegetation to a range of fire regimes and to elucidate the natural role of fire in the south Florida ecosystem. Three seasons and two frequencies of experimental burns will be carried out in the Raccoon Point area of Big Cypress National Preserve. The study will document the effect of the experimental treatments on the structure and composition of the vascular vegetation, population responses of selected endemic herbaceous taxa, and the distribution of pine and cypress along landscape gradients.

RESTORATION BENEFITS: This study will provide direction for the fire management of Big Cypress National Preserve, Everglades National Park, Florida Panther N.W.R., and National Key Deer Refuge. It will improve the use of fire to restore vegetation, increase populations of endemic plants, and maintain habitat for listed species such as the red-cockaded woodpecker and the Key deer.

Time Line and Fiscal Year Budget (in thousands of dollars) for Long-term Study of Fire Regimes in Pineland and Associated Cypress Wetland

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Burns	■	■	■	■	■	■										
Vegetation	■	■	■	■	■	■										
Endemic Taxa	■	■	■													
Pine/Cypress Ecotone	■	■	■													
Project																
	141	141	144	76	76	82										660
Subtotal																660

TITLE: Strand Structure and Productivity of Short-hydroperiod Graminiod Wetlands			
SUBREGION : 3,5	***PROJECT ID:*** SW37	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research		
PROJECT PLAN MANAGER: James R. Snyder	***BASIS:***	***TOTAL:*** $470,000	
LEAD ORGANIZATION(S): BRD/USGS, NPS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S):			
COUNTY(S): Collier, Dade, Monroe		TOTAL: New	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $470,000	
START: 1998	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The short-hydroperiod marshes (wet prairies, muhly prairies, marl prairies) constitute a major component of Everglades National Park and Big Cypress National Preserve and are habitat of the endangered Cape Sable seaside sparrow. These habitats are thought to have been affected by altered hydrologic and fire regimes. This study will establish permanent vegetation plots in short-hydroperiod marshes throughout the lower Everglades and Big Cypress, including current and past Cape Sable seaside sparrow habitat. Vegetation structure and composition will be measured and aboveground biomass estimated seasonally and after fires. This will establish baseline conditions against which to measure future changes and will provide necessary information for modeling of vegetation dynamics.

RESTORATION BENEFITS: The baseline information will be used evaluate changes brought about by hydrologic restoration and to develop and refine landscape vegetation models.

Time Line and Fiscal Year Budget (in thousands of dollars) for Strand Structure and Productivity of Short-hydroperiod Graminiod Wetlands

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Establish Plots																
Resample Plots																
Project																
		146	106	108	110											470
Subtotal																

TITLE: Aquatic Animal Dynamics in Big Cypress Habitats

SUBREGION : 5	***PROJECT ID:*** SW38	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research	***TOTAL:*** $210,000	
PROJECT PLAN MANAGER: William F. Loftus	***BASIS:*** 2,3	***APPROPRIATED TO DATE:*** TOTAL: $0	
LEAD ORGANIZATION(S): USGS - BRD		***REMAINING FINANCIAL REQUIREMENT:***	
SUPPORTING ORGANIZATION(S): FL International Univ.		***TOTAL:*** $210,000	
COUNTY(S): Dade, Collier, Monroe			
LINKED PROJECTS: **Dependent on:** Hydrological Projects and ATLSS **Critical to:** ATLSS **Associated with:**			
START: Jan 1998	***END:*** Sept 2003	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Most studies of aquatic animals have been located in Everglades habitats. The Big Cypress Swamp offers a different series of landscapes to aquatic animals and their predators, but one that plays an integral role in the function of the greater Everglades ecosystem. This project would document the use of major aquatic habitats in the Swamp by fishes and macroinvertebrates across seasons and years to understand how the habitat mosaic supports these populations. The first part of the study will involve pilot sampling and statistical consultation to determine an efficient, stratified sampling design. Presently ATLSS will have to use Everglades data in its Big Cypress model cells due to lack of data for that region.

RESTORATION BENEFITS: : Provide data for ATLSS models to evaluate alternatives for ecological effects of the C&SF Restudy, C-111 Project, and MODFLOW.

Time Line and Fiscal Year Budget (in thousands of dollars) for Aquatic Animal Dynamics in Big Cypress Habitats

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Pilot Study		■													20	20
Field Work		■	■	■	■	■									100	100
Lab Work		■	■	■	■	■									75	75
Final Report							■								15	15
Project																
Subtotal		35	40	40	40	40	15								210	

TITLE: Seminole Critical Project for the West side of the Big Cypress Water Conservation Project

SUBREGION : 5	***PROJECT ID:*** SW39	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Infrastructure Investment	USACE: $11,726,000 Tribe: $11,726,000	
PROJECT PLAN MANAGER: Tepper (954) 966 630 x1120 and Brooks-Hall	***BASIS:*** 1	***TOTAL:*** $23,452,000	
LEAD ORGANIZATION(S): Seminole Tribe of Florida		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): USACE, NRCS, BIA			
COUNTY(S): Hendry and Broward		***TOTAL:*** $0	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** SW14,TS85, TS86,SW15,SW05, SW03		***REMAINING FINANCIAL REQUIREMENT:***	
START: 1998	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The Seminole Tribe's Big Cypress Reservation is located in Hendry and Broward Counties, directly north of the Big Cypress National Preserve. This critical project provides for the design and construction of water control, management, and treatment facilities in Basins 1,2,3, and 4, which compose the western portion of the Big Cypress Reservation. The project elements include conveyance systems, including major canal bypass structures, irrigation storage cells, and water resources areas. This project is designed to meet 50 ppb phosphorus, which is the current performance level designed to be achieved by the Everglades Construction Project. Should design performance levels for phosphorus become more stringent, this project is designed to be able to incorporate additional technology to meet stricter levels. This project will enhance the hydroperiod in Big Cypress National Preserve through Mullet Slough and improve the water quality in the Everglades Protection Area.

As demonstrated below, this project will produce substantial restoration, preservation, and protection benefits and will do so immediately and independently of the completion of any other project. A water conservation project for the eastern side of the reservation, as well as the reservation-wide agricultural best management practices (BMPs), have been planned also. This critical project can be constructed and will function independently of the infrastructure needed on the eastern side of the Reservation and the BMPs.

This project is estimated to cost $23,452,000; this amount is well under the $50 million cap. The Seminole Tribe will be the local sponsor. This project can be initiated well before the 30 September 1999 deadline, primarily because the Tribe has such a well developed conceptual plan for the project. This project is not an authorized component of the C & SF Project. And finally, this project is incorporated into the Governors Commission's Conceptual Plan.

RESTORATION BENEFITS: This network of surface water management structures will produce the following substantial restoration, preservation, and protection benefits and will do so immediately and independently of the completion of any other projects:

-Remove phosphorus and other pollutants from water leaving the Reservation and flowing to the Big Cypress National Preserve into Mullet Slough to the Everglades Protection Area.. The removal of these pollutants will be achieved using natural treatment processes, in pretreatment cells and water resource areas (WRA's). Unlike the stormwater treatment areas in the Everglades Construction Project, the Tribe's WRA's will take advantage of the natural treatment processes and will serve additional functions in the storage and conveyance of water.

-Rewater the Big Cypress National Preserve. This project will provide the opportunity to restore more natural hydroperiods in the Big Cypress National Preserve. Bypass structures will be built under the West Feeder Canal that will sheetflow clean water south along the length of the Feeder Canal into the Big Cypress Preserve. The clean water sent l a sheetflow over the Preserve and into Mullet Slough will improve the hydrology in the Everglades Protection Area as well.

-Convey and store irrigation water. To make use of water provided by the SFWMD to replace the Tribe's diverted Compact water rights, the Tribe needs to be able to move and store such water when it is available. Water

conveyance improvements and irrigation storage cells will move and store the Compact water converted for Everglades Restoration. This diversion allowed for treatment of water flowing to the Everglades Protection Area.

-Provide improved flood control. To [prevent extended periods of flooding and to limit downstream impacts of flooding, stormwater must be controlled. Stormwater attenuation areas will detain water from large storm events.

Time Line and Fiscal Year Budget (in thousands of dollars) for the *:* Seminole Critical Project for the West side of the Big Cypress Water Conservation Project																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Studies																
Develop/Constr																
Project																
Seminole Tribe		500	4,436	3,690	2,398	702										11,726
USACE		500	4,436	3,690	2,398	702										11,726
Subtotal		1000	8872	7380	4796	1404										**$23,452**

TITLE: Plant Biodiversity of Big Cypress National Preserve			
SUBREGION : 5	***PROJECT ID:*** SW40	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research		
PROJECT PLAN MANAGER: James R. Snyder	***BASIS:***	***TOTAL:*** $48,000	
LEAD ORGANIZATION(S): BRD/USGS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S):			
COUNTY(S): Collier, Dade, Monroe		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $48,000	
START: 1998	***END:*** 1999	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Intensive field surveys will be conducted in the 147,000 acres of Big Cypress National Preserve addition lands over a two year period to document vascular plant species present. Emphasis will be on finding species new to the preserve, including potential problem exotic species such as the tropical soda apple. Populations of rare and endangered species will be recorded in a GIS database. Voucher specimens will be collected and deposited in appropriate herbaria. An annotated vascular plant list for the preserve will be published. Because the BICY addition lands are mainly north of the original preserve, where the Big Cypress grades into the western flatlands of J.H. Davis, it is expected that a large number of new species will be found on these Interior trust lands. The principal investigator will be Dr. Daniel Austin of Florida Atlantic University.

RESTORATION BENEFITS: Knowledge of the vascular flora of public trust lands within the restoration area is a prerequisite to monitoring the effects or appropriateness of restoration actions. The survey may discover other noxious plant pests such as tropical soda apple that must be controlled

Time Line and Fiscal Year Budget (in thousands of dollars) for Plant Biodiversity of Big Cypress National Preserve

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Field Work																
Report																
Project																
		24	24													48
Subtotal																

TITLE: Hydrologic reconnaissance of the gray limestone aquifer of South Florida			
SUBREGION : 5	***PROJECT ID:*** SW41	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY:	***BUDGET CATEGORY:***		
PROJECT PLAN MANAGER: Ron Reese 305-594-0655	***BASIS:*** 2	***TOTAL:*** $756,000	
LEAD ORGANIZATION(S): USGS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): SFWMD, FDEP			
COUNTY(S): Collier, Monroe, Dade, Broward		***TOTAL:*** $323,600	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $432,400	
START: 10/1996	***END:*** 9/1999	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The gray limestone aquifer, a major component of the surficial aquifer system of south Florida, was initially identifed in western Broward and Dade Counties and has since been found to extend westward. It is generally 50-70 ft. thick, extends from 50 to 150 ft in depth, and has a transmissivity of as high as 90,000 ft^2/day. It could be stratigraphically equivalent to the Lower Tamiami Aquifer. The lithology, areal extent, thickness, and hyraulic characteristics of this aquifer will be identified. Most of the study area is in eastern Collier County, east of SR 29, and in southern Hendry county. It overlaps into some of Palm Beach, Broward, Dade, and Monroe Counties. Study boundaries are 26° 32'N, 81° 22'W on the northwestern corner and 25° 30'N, 80° 33'W on the southeastern corner.

RESTORATION BENEFITS: The relationships between wetlands and shallow ground water, such as found in the gray limestone aquifer, need to be better defined.

Time Line and Fiscal Year Budget (in thousands of dollars) for Hydrologic reconnaissance of the gray limestone aquifer of South Florida

Task	97& Prior	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
USGS	162	130	86													378
SFWMD	162	131	85													378
Subtotal	324	261	171													$756

TITLE: Investigation of Kemp's Ridley Turtles *(Lepidochelys kempi*) in the Coastal Waters of Southwest Florida.			
SUBREGION : 05	***PROJECT ID:*** SW42	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Research		
PROJECT PLAN MANAGER: Wayne N. Witzell, 305-361-4272	***BASIS:***	***TOTAL:*** $750,000	
LEAD ORGANIZATION(S): NMFS/SEFSC		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S):			
COUNTY(S): Collier		***TOTAL:*** $75,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $675,000	
START: 1997	***END:*** 2006	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Anecdotal information suggested that Kemp's ridley turtles were abundant along both coasts of Florida and in Florida Bay prior to 1950. Commercial fishermen frequently reported captures of subadult Kemp's ridley turtles along the Gulf coast of Florida until the early 1970s. However, the current status of this species in southwest Florida is unknown and requires scientific investigation. The purpose of this project is to establish long-term indices of marine turtle abundance and habitat requirements in the nearshore waters of Gullivan Bay and the Ten Thousand Islands. Efforts will focus on the Kemp's ridley turtle, but it is anticipated that other marine turtle species will be encountered during sampling operations.

RESTORATION BENEFITS: This project will provide information on the relative abundance, seasonal occurrence, and habitat utilization of Kemp's ridley turtles in southwest Florida coastal waters which is essential to the recovery and management of this critically endangered species.

Time Line and Fiscal Year Budget (in thousands of dollars) for Investigation of Kemp's Ridley Turtles *(Lepidochelys kempi*) in the Coastal Waters of Southwest Florida

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Preliminary surveys	■															
Systematic surveys		■	■	■	■	■	■	■	■	■						
Project																
NMFS/SEFSC	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0						750
Subtotal																**750**

TITLE: Stratigraphy and hydrogeology of the surficial aquifer system of Southwest Florida

SUBREGION : 5	***PROJECT ID:*** SW43	***FINANCIAL REQUIREMENT:***
PROGRAM CATEGORY:	***BUDGET CATEGORY:***	
PROJECT PLAN MANAGER: Suzanne Weedman 703-648-6379	***BASIS:*** 2	***TOTAL:*** $866,045+FY99 +FY99 needs
		APPROPRIATED TO DATE:
LEAD ORGANIZATION(S): USGS		
SUPPORTING ORGANIZATION(S): SFWMD, FDEP		
COUNTY(S): Monroe and Collier		***TOTAL:*** $481,259
		REMAINING FINANCIAL REQUIREMENT:
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $384,786+FY99 +FY99 needs
START: 10/1996	***END:*** 9/1999	***APPROVED:*** 11/97 ***LAST REVISION:*** 2/98

DESCRIPTION: About 25 coreholes will be drilled to the base of the surficial aquifer system (averaging 200 ft depth) in Collier and Monroe Counties. Drilling, permeability testing, lithologic and geophysical logging, age determination, and interpretation will be accomplished by personnel of the U.S. Geological Survey and the Florida Geological Survey, in cooperation with the South Florida Water Management District. Continuous cores through the surficial aquifer system are being drilled and examined for mineralogy, composition, texture, structures, and fossils to determine lithology, age, alteration, and porosity of the aquifer rocks and to construct a depositional model to aid in the extrapolation of subsurface data. Stratigraphic units will be correlated between coreholes, and their lithologic and hydrologic properties estimated where core data are absent. Permeability tests will be run on core samples and integrated with hydrologic and geophysical logs to estimate transmissivities of lithofacies. Geophysical logs (natural gamma, caliper, resistivity [long and short normal], focused resistivity, temperature, neutron, density, flowmeter, televiewer) will be run as holes are drilled. The primary product will be an array of cross sections of the surficial aquifer system that, when combined, will yield a three-dimensional grid of the stratigraphy and hydraulic conductivity of the system. The project's geographic extent is roughly 26.1° N on north, 81.68° W on west, 25.73° N on south, and 80.87° W on east. The area bounded roughly by Route 941 on the west, Tamiami Trail and the Loop Road on the south, and the Collier County line on the east; it extends slightly beyond I 75 on the north. This project will be share cores and hydrogeological data with a complementary project directed by Ron Reese, USGS-Miami, to assess the spatial extent of the gray limestone aquifer of the surficial aquifer system in south-central Florida.

RESTORATION BENEFITS: Management decisions will be made in part on the basis of groundwater models of the surficial aquifer system. Models that accurately simulate the hydrologic system will be essential for efficient utilization of the limited freshwater resources of southwest Florida. Hydrologic models require input of high-resolution stratigraphic and sedimentologic data to accurately describe groundwater flow in the surficial aquifer system. However, the stratigraphy and sedimentology are poorly known. This study will provide essential hydrogeologic data to extend existing and next-generation water management, natural system, and other models to the southwest coast.

Time Line and Fiscal Year Budget (in thousands of dollars) for Stratigraphy and hydrogeology of the surficial aquifer system of Southwest Florida

Task	97& Prior	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
USGS/Reston	481	385														
Subtotal	481	385														866

TITLE: Okaloacoochee Slough		
SUBREGION : 5	***PROJECT ID:*** SW44	***FINANCIAL REQUIREMENT:***

PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	SFWMD $11,502,060 DEP $4,775,000	
PROJECT PLAN MANAGER: Chuck Rinaldi (561) 687-6537	***BASIS:*** 3	***TOTAL:*** $16,277,060	
LEAD ORGANIZATION(S): SFWMD		***APPROPRIATED TO DATE:*** SFWMD $11,502,060	
SUPPORTING ORGANIZATION(S):		DEP $4,775,000	
COUNTY(S): Hendry and Collier		***TOTAL:*** $16,277,060	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** SW12, SW08, SW13		***TOTAL:*** $0	
START: 1998	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This site contains more than 31,000 acres in Hendry and Collier Counties. It is a major tributary to Fakahatchee Strand and Big Cypress National Preserve. It is dominated by a central slough, consisting of sawgrass marshes and wet prairies, with fringes of live oak/cabbage palm hydric hammocks. Most of the pines have been logged, but otherwise the site is pristine. SFWMD acquired 21,000 acres in 1996. Approximately 10,018 acres remain to be purchased. Prior to the acquisition, it was used for native range grazing. Okaloacochee Slough is critical habitat for the Florida Panther.

RESTORATION BENEFITS: Some exotic treatment is needed to control minor infestations of Brazilian pepper and melaleuca. Hydrologically, the property remains undisturbed. The remaining land acquisition costs will be shared 50/50 between SFWMD and DEP. The initial purchase totaling $11.5 million was funded entirely by SFWMD. DEP will reimburse SFWMD for a portion of the initial acquisition costs and acquire a 50% undivided interest in the entire project.

Time Line and Fiscal Year Budget (in thousands of dollars) for Okaloacoochee Slough

Task	96-97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Acquisition	11502	4775														16,277
Subtotal																**$16,277**

3.7 *FLORIDA KEYS*
Sub-Region 6

ECOLOGICAL SETTING

Sub-region 6 is comprised of a rich diversity of terrestrial and marine habitats, including tropical hardwood hammocks, globally endangered pine rocklands, fringing mangrove, transitional wetland habitats, seagrass meadows, tidal passes, hard bottom communities, and patch and fringing reefs.

The geographic setting of the Sub-region includes the southern portions of Florida Bay and Biscayne Bay, the Florida Keys from Soldier Key to the Dry Tortugas, and the Florida reef tract. Also included are the nearshore and tidal pass areas between and surrounding the Keys and the Gulf of Mexico shelf area lying just north of the westernmost Keys.

Geologically, the area is characterized by the emergent islands of the Keys which are representative of a Pleistocene reef tract (100,000 years) known as the Key Largo Limestone formation, in the easternmost Keys, and the Miami Oolite formation in the westernmost Keys.

Though only the southern portion of Florida Bay lies within the Sub-region, it is worth noting that this is an expansive area of interconnected shallow water banks and mangrove islands. Recently, extensive seagrass die-offs and the development of algal blooms and areas of high turbidity have threatened the ecological health of Florida Bay (Sub-region 3) and this Sub-region.

The Florida Keys represents a complex mix of tropical flora and temperate fauna. Many endemic species are found in the Keys. Because of the small island setting, in addition to the encroaching impacts of humans, approximately 71 plant and over 20 animal species are considered Threatened or Endangered.

Shallow water patch reef complexes and the reef tract make the Sub-region unique in the continental Untied States. Characteristic of coral reef environments, they exhibit high biodiversity of both invertebrate and fish species. The overall health and stability of these areas is dependent on clear, oligotrophic waters. Currently, the flow of degraded waters from Florida Bay is having a defined impact on some of the reef tract areas, particularly adjacent to major tidal passes between the Keys. Additional impacts are result from less manageable impacts that seem to be occurring on both a Caribbean and global scale. Researchers have noted increasing incidents of coral disease and diminishing coral cover.

The population of the Florida Keys is over 85,000 based on 1990 census projections. The Keys rely heavily on their tourist-based economy and the health of the marine and upland resources factors heavily in individual decisions to visit the Keys. During a recent study (1995-96), it was determined that approximately 3 million visitor trips annually are made to the Keys totally over 16 million person days of time spent while visiting. These visitors generate over 1.1 billion dollars in direct output and income that result in the creation of over 13,600 jobs within the Keys economy.

The shallow water environments of the Keys and Florida Bay support extensive

nursery grounds for a variety of important commercial fish and crustaceans species most of which are also harvested in the area. Among important economic species, pink shrimp, spiny lobster, and stone crab landings alone brought over 125 million dollars to the local Keys economy in 1994.

SPECIAL MANAGEMENT AREAS

The Florida Keys were designated as an Area of Critical State Concern by the State of Florida in 1975. In 1987 the State also designated the waters surrounding the Keys as Outstanding Florida Waters. There are a number of important marine, wildlife, and ecological management areas in and surrounding the Florida Keys. These include the Florida Keys National Marine Sanctuary, which encompass approximately 2,800 nautical square miles, Biscayne National Park, and the Dry Tortugas National Park and Monument. The Fish and Wildlife Service manages four important refuge areas in and surrounding the Keys; these include the Key Deer, Great White Heron, Key West, and Crocodile Lakes National Wildlife Refuges. There are at least five state parks, John Pennekamp Coral Reef, Long Key, Curry Hammocks, Bahia Honda, and Fort Zachary Taylor State Parks; four state aquatic preserves, including Biscayne, Card Sound, Lignum Vitae, and Coupon Bight, Aquatic Preserves; two state botanical sites, including Lignum Vitae State Botanical Site; one state historic site, and one state geologic site.

LINKAGE TO THE TOTAL SYSTEM

Sub-region 6 lies at the southern extreme of the South Florida Ecosystem. The many diverse habitats of the Sub-region constitute a closely coupled interface between the land and water areas of the Region.

Inland areas of south Florida are the source of fresh water to the coastal areas, including Florida and Biscayne Bays, Manatee Bay, and Barnes, Card, and Blackwater Sounds. Aside from the natural influences of the freshwater drainage through these areas, a number of water management canals discharge to these receiving waters. These serve as a direct link to upstream areas and are a source of nutrient and contaminant contributions from urban and agricultural areas.

The influences of Sub-region 3, particularly Florida Bay, on the water quality of the Florida Keys and the adjacent reef tract are of major concern. Though, there appears to be some improvement in the state of Florida Bay, algal blooms and turbid water conditions persist. These influences may have their most dramatic impacts at the coral reef. The reef tract is characterized by coral species which do not tolerate high turbidity or nutrient loads.

Southern Dade County ground water is the source of potable water for the Florida Keys; thus, wellfield contamination problems or salt water intrusion in Sub-region 3 impact Sub-region 6.

The Florida Keys provides linkages to the broader continental and Caribbean regions. As is well noted in the Fall and Winter, migratory birds utilize the Keys as a final “jumping-off point” to the Caribbean, and Central and South America. Endangered sea turtles migrate broadly within the greater Atlantic and Caribbean Regions, often frequenting the Keys area and nesting on their beaches. Valuable commercial and recreational fish species, particularly those that use the Straits of Florida and the Gulf Stream, also

establish important linkages to the South Florida, Atlantic, Caribbean, and Gulf Regions.

ECOSYSTEM PROBLEMS AND RESTORATION OBJECTIVES

The upland, near-shore, and coral reef environments of Sub-region 6 have all been altered by anthropogenic influences within and external to the sub-region.

Integral to the improvement of the Sub-region is the improvement of Sub-region 3, the Everglades and Florida Bay. This is essential to the ultimate improvement in Sub-region 6. The Sub-region includes the southern edge of Florida Bay where stresses such as extensive seagrass die-off, diminished water clarity, phytoplankton blooms, the death of mangroves on isolated mangroves islands, and reduced numbers of both benthic species and notable commercial species are all a concern.

Extensive areas of upland habitat have been destroyed or fragmented by development in the Keys. Little additional, development is currently allowed within larger intact areas at this time. However, for the sake of improved management, it is important to provide these areas with an enhanced level of protection. The tropical hardwood forests and pine rocklands of the Keys are significant remnants of historically more expansive plant communities found in the South Florida ecosystem. Threats from exotic plant invasion are significant in this light. The influences of exotic plant species intrusion and the poaching of endangered plant species, particularly bromeliads and orchids, has a significant impact on the current and future quality of these resources. Exotic plant pests, including Australian pine, Brazilian pepper, and Asiatic colubrina represent nearly 10 percent of the land cover in the Keys. Land acquisition and active land management, including exotic removal programs, are key components of necessary protection efforts in the Sub-region.

Nearshore components of the Sub-region are receiving a variety of stresses as a result of direct and indirect impacts. The Keys have grown from a rural community to a suburban or even urban setting through the last fifty years. Antiquated wastewater management practices reminiscent of its rural past still predominate. There are over 20,000 permitted on-site septic systems in the Florida Keys and as many as 9,000 unpermitted cesspits. The nutrient impacts of either system influence the heath of the Keys nearshore waters. Improvements in current wastewater management practices are essential.

The Keys shallow water resources, including seagrass meadows and algal flats, are being impacted directly by boaters who cross these areas either unwittingly or intentionally. Some 30,000 acres of seagrass have been prop scarred by boaters in the Florida Keys area. These are impacts that may be managed and improved by appropriate use of education, channel marking, zoning, and enforcement measures.

The coral reef is receiving both external and internal impacts in the Sub-region. The health of the coral ecosystem is in question as a result of the influences of Florida Bay, Caribbean and global influences, and the direct impacts of humans. Significant study is still necessary to determine the proportional cause and effect relationships. However, efforts to manage access to the most utilized areas, through marine zoning and use restrictions should help improve the coral reef tract area.

RESTORATION OBJECTIVES:

The restoration objectives of critical importance to Sub-region 6 have been identified by the Working Group and are listed as follows:

- Restore water budgets, circulation dynamics, and historic salinity patterns to Florida Bay.
- Restore water quality and nutrient cycling in Florida Bay and in nearshore and confined waters.
- Restore seagrass, mangrove, coral reef, and other habitats.
- Preserve and restore upland biological communities.
- Protect and restore endangered species.

RESTORATION PROJECTS:

Important restoration projects in progress or proposed for the Sub-region are identified on the following pages:

TITLE: Complete Land Acquisition for Biscayne National Park			
SUBREGION : 6	***PROJECT ID:*** FK02	***FINANCIAL REQUIREMENT:*** Federal/ County (TBD)	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition		
PROJECT PLAN MANAGER: Dick Frost (305)230-1144	***BASIS:*** 3	***TOTAL:*** $6,100,000	
LEAD ORGANIZATION(S): NPS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): Dade County			
COUNTY(S): Dade		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:***	
START: 1998	***END:*** 2000	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project includes acquisition of the five Ragged Keys (602 acres) and approximately 1400 acres of coastal wetlands and mangrove forest in Biscayne National Park. The Ragged Keys are five islands immediately adjacent to the most popular public use area in the Park, Boca Chita Key. Four of the five islands are unoccupied and are used by the public for overflow camping, fishing, and swimming, with resulting damage to natural habitat on the islands and in the surrounding shallows. Litter and human waste are serious problems. Least terns nest on land and endangered sea turtles nest on the shoreline, and these nesting areas are being greatly disturbed. All five of the islands have been repeatedly considered by developers for major resort or recreation facilities.

RESTORATION BENEFITS: Acquisition of the Ragged Keys would preclude land uses that are incompatible with the protection, conservation, and restoration management objectives of the NPS. Public ownership will assure consistent management of the Keys within the Park. The coastal wetlands and mangrove fringe are essential for protecting the Biscayne Bay ecosystem and are part of the last remaining mangrove forest on the east coast of Florida. So little is left that loss of any of this habitat is prejudicial to the health of the bay ecosystem.

Time Line and Fiscal Year Budget (in thousands of dollars) for Complete Land Acquisition for Biscayne National Park

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Acquition																
Project																
Fed/ County	2000	2000	0	2100												6100
Subtotal																**$6,100**

TITLE: Complete Crocodile Lake National Wildlife Refuge			
SUBREGION : 6	***PROJECT ID:*** FK03	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition		
PROJECT PLAN MANAGER: Stieglitz/Klett 305/872-2239	***BASIS:*** 1,2,3	***TOTAL:*** $786,000	
LEAD ORGANIZATION(S): USFWS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S):			
COUNTY(S): Monroe		***TOTAL:*** $400,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $386,000	
START: FY1998	***END:*** FY2000	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The Crocodile Lake National Wildlife Refuge consists of approximately 5,500 acres of mangrove wetlands, 300 acres of open water, and 1,200 acres of globally endangered tropical hardwood hammock on Key Largo. The Refuge was established in 1980 to protect habitat critical to several endangered endemic animals, including the Schaus' swallowtail butterfly, Key Largo woodrat, Key Largo cotton mouse, and American crocodile. Approximately one-quarter of all American crocodile nests in the US occur on this Refuge. The Refuge also provides habitat for other imperiled species, including the white-crowned pigeon, Florida (*Liguus)* tree snail, Eastern indigo snake, West Indian manatee, and osprey.

RESTORATION BENEFITS: Completion of this acquisition project will significantly contribute to the Multi-Species Recovery Strategy (TS19-M) by protecting and preserving a globally endangered plant community which provides habitat for four federally-listed endemic animals and a host of associated imperiled plants and animals. This project compliments complete North Key Largo Hammocks (CA7-L), which provides many of the same restoration benefits. In addition, public ownership will allow control of invasive exotic species on the lands slated for purchase, thereby reducing the threat posed by these species to native communities. These lands also serve as a buffer to the Outstanding State Waters of Card and Barnes Sounds at the southern end of the C-111 canal.

Time Line and Fiscal Year Budget (in thousands of dollars) for Complete Crocodile Lake National Wildlife Refuge																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
USFWS		400	200	186												786
Subtotal																**$786**

TITLE: Complete Florida Keys Ecosystem CARL Project			
SUBREGION : 6	***PROJECT ID:*** FK05	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	FDEP:	
PROJECT PLAN MANAGER: Outland (904) 488-4892	***BASIS:*** 1, 2 and 3	***TOTAL:*** $36,793,484 (estimated)	
LEAD ORGANIZATION(S): FDEP		***APPROPRIATED TO DATE:*** FDEP:	
SUPPORTING ORGANIZATION(S): USFWS, FGFWFC, MCLA			
COUNTY(S): Monroe		***TOTAL:*** $27,174,425	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** TS19, FK06		***TOTAL:*** $9,619,059 (estimated)	
START: 1992	***END:*** when completed	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project, in conjunction with the Complete National Key Deer Refuge proposal, includes the remaining 4,438 acres of tropical hardwood hammocks and pine rocklands of significant size and quality remaining in the Florida Keys from southern Key Largo to Sugarloaf Key.

RESTORATION BENEFITS: This project will result in the protection of the largest remaining parcels of the rapidly diminishing globally endangered tropical hardwood hammock and pine rocklands plant communities and critical freshwater resources. The benefits of protecting these habitats will extend to a host of associated imperiled species of plants and animals, such as the white-crowned pigeon, Florida *(Liguus)* tree snail, Florida tree cactus, Lower Keys marsh rabbit, and Garber's spurge, as well as hundreds of species of migratory birds. Public ownership of these lands will allow the removal of invasive exotic species which are further threatening native ecosystems. Protection of these remaining natural areas is also critical to preventing further declines in nearshore water quality associated with development and stormwater runoff. Completion of this project supports the FWS's and FDEP's approximately $50,000,000 investment in protecting the natural resources of the Keys. Completion will significantly contribute to the Multi-Species Recovery Strategy (TS19) by protecting and preserving habitats critical to many imperiled plant and animal species.

Time Line and Fiscal Year Budget (in thousands of dollars) Complete Florida Keys Ecosystem CARL Project																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
FDEP		4,000	3,000	2,619												
Subtotal		4,000	3,000	2,619												**$9,619**

TITLE: Complete National Key Deer Refuge			
SUBREGION : 6	***PROJECT ID:*** FK06	***FINANCIAL REQUIREMENT:*** Federal: Land and Water Conservation Fund	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition	***TOTAL:*** $14,000,000	
PROJECT PLAN MANAGER: Stieglitz 305/872-2239	***BASIS:*** 1, 2, and 3	***APPROPRIATED TO DATE:***	
LEAD ORGANIZATION(S): USFWS			
SUPPORTING ORGANIZATION(S): DEP, SFWMD, MCLA			
COUNTY(S): Monroe		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** TS19, FK05		***TOTAL:*** $14,000,000	
START: 1997	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The National Key Deer Refuge was established to protect and maintain the remaining 4,059 acres of habitat for the endangered Key Deer, which is threatened by land clearing for residential housing. This project would complete the Refuge by acquiring a system of no-development corridors on the south half of Big Pine Key to ensure the continued protection of Key Deer habitat. At the same time, the Refuge maintains more than 80 percent of the remaining pine Rockland habitat in the Florida Keys.

RESTORATION BENEFITS: Acquisition of these lands is the highest priority recovery action for the endangered Key deer by protecting the largest remaining parcels of the rapidly diminishing globally endangered tropical hardwood hammock and pine rocklands plant communities and critical freshwater lenses on Big Pine Key. The benefits of protecting these habitats will extend to a host of associated imperiled species of plants and animals, such as the white-crowned pigeon, liguus tree snail, Florida tree cactus, Lower Keys marsh rabbit, and Garber's spurge, as well as hundreds of species of migratory birds. Public ownership of these lands will allow the removal of invasive exotic species which are further threatening native ecosystems. Protection of these remaining natural areas is also critical to preventing further declines in nearshore water quality associated with development and stormwater runoff. Completion of this project supports the FWS's and FDEP's approximately $50,000,000 investment in protecting the natural resources of the Keys. Completion will significantly contribute to the Multi-Species Recovery Strategy (TS19) by protecting and preserving habitats critical to many imperiled plant and animal species.

Time Line and Fiscal Year Budget (in thousands of dollars) Complete National Key Deer Refuge																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Master Plan																
Project																
		4000	4000	4000	2000											14,000
Subtotal		4000	4000	4000	2000											**$14,000**

TITLE: Complete North Key Largo Hammocks State Botanical Site			
SUBREGION : 6	***PROJECT ID:*** FK07	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Land Acquisition	***BUDGET CATEGORY:*** Land Acquisition		
PROJECT PLAN MANAGER:	***BASIS:*** 1 & 3	***TOTAL:*** $73,733,875 Estimated	
LEAD ORGANIZATION(S): FDEP		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): USFWS			
COUNTY(S): Monroe		***TOTAL:*** $71,000,034	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** FK03, TS19		***TOTAL:*** $2,733,841 Estimated	
START: 1983	***END:*** Completion	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The hammocks of north Key Largo form the largest stand of West Indian tropical forest in the United States. This rapidly disappearing forest, which is called Rockland forest, supports a wide diversity of rare plant and animal species. Degraded water quality is becoming an increasing issue in Florida Bay and the Florida Keys, as natural lands are converted to residential housing and commercial development. The project area has over 10 miles of shoreline that directly influences the adjacent waters of John Pennekamp Coral Reef State Park. As in other parts of the Keys, development seriously threatens this area.

RESTORATION BENEFITS: Protecting the remaining natural areas in the Keys will be critical to preventing water quality from degrading further. The preservation of this area in its natural state is important for maintaining the high degree of water quality that is necessary to support the living reef of John Pennekamp State Park. The project is designated for use as a botanical site, with such uses as hiking and nature appreciation. Completion of this acquisition project will signficantly contribute to the Multi-Species Recovery Strategy (TS19) by protecting and preserving a globally endangered plant community which provides habitat for four federally-listed endangered endemic animals and a host of associated imperilled plants and animals. This project compliments Complete Crocodile Lake National Wildlife Refuge (CA3), which provides many of the same restoration benefits. In addition, public ownership will allow control of invasive exotic species on the lands slated for purchase, thereby reducing the threats posed by these species to native communities.

Time Line and Fiscal Year Budget (in thousands of dollars) Complete North Key Largo Hammocks State Botanical Site

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Master Plan																
Project																
		400	400	200												1,000
Subtotal		400	400	200												**$1,000**

TITLE: Florida Keys Carrying Capacity Study			
SUBREGION : 6	***PROJECT ID:*** FK14	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Management	USACE: $3,000,000 State of Florida: $3,000,000	
PROJECT PLAN MANAGER:	***BASIS:***	***TOTAL:*** $6,000,000	
Charles Pattison: (850) 922-1751 CPT Ted Pruett: (904) 232-3952	1	***APPROPRIATED TO DATE:*** DCA: $500,000	
LEAD ORGANIZATION(S): USACE/State of Florida			
SUPPORTING ORGANIZATION(S): FWS, FDOT, SFWMD, FDEP, HRS, FDCA, Monroe Co.		***TOTAL:*** $500,000	
COUNTY(S): Monroe		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** FK15, FK16,FK17 **Critical to:** **Associated with:** FK18		***TOTAL:*** $5,500,000	
START: 1998	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: In 1996 the Governor issued Executive Order 96-108, which directed public agencies to take action to improve environmental conditions in the Keys. Included in the order was the direction to conduct a carrying capacity study/analysis. The analysis will develop information that will improve decision--making regarding development approvals and infrastructure investments, and its impact on the ecology and natural system in the Florida Keys and Florida Bay. The study will specifically address recent findings made by the Governor and Cabinet that the Monroe County Comprehensive Plan was not in compliance with growth management statutes. This finding was made because near shore waters, sea grasses, and the Key Deer have reached their carrying capacity limits, public hurricane evacuation is at the upper limit of acceptability, and impacts from the development of existing and vacant property are inconsistent with the continued protection of sensitive environmental resources. The State of Florida has spent $177,000 to date in scope of work development for the study with the U.S. Army Corps of Engineers. This commitment by the state combined with an aggressive effort to include public input into the scoping process has resulted in the Corps of Engineers developing a unique scope of work for the study.

RESTORATION BENEFITS: The Florida Keys, including Florida Bay and the offshore coral reefs and seagrasses, are a threatened natural area of international significance. Poorly managed growth and development in the Keys has overwhelmed the area's fragile ecology and quick action must be taken to arrest and reverse the decline. While not blocking all new growth, the Governor and Cabinet recently limited the number of building permits that can be issued by Monroe County.

The study will determine what level of human population and activities that can be supported by a healthy, balanced, functioning ecosystem in the Florida Keys through the identification of component thresholds which define ecosystem sustainability. The study will combine existing and new data in a usable form and provide a comprehensive basis for coordinating and strengthening land use planning efforts by local, state, and federal agencies. This study will combine data from all agencies active in the Florida Keys and provide projections of the consequences for both action and inaction. This study will provide a tool, for making sound planning decisions, decisions that are central to a sustainable Florida Keys ecosystem.

Time Line and Fiscal Year Budget (in thousands of dollars) for Florida Keys Carrying Capacity Study

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Study																
Project																
State of Florida			500	1,250	1,250											3,000
USACE		200	500	1,250	1,050											3,000
Subtotal		200	1,000	2,500	2,300											**$6,000**

Note: *** Critical Project Funding - requires approval from HQ USACE, PCA negotiation with sponsor, contract development and contract award prior to start of project, this is underway now and is estimated to take approximately a year to complete.

TITLE: Florida Keys Nutrient Feasibility Study			
SUBREGION : 6	***PROJECT ID:*** FK15	***FINANCIAL REQUIREMENT:*** cost-share (proposed)	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Research	State $500,000 Federal $560,000	
PROJECT PLAN MANAGER: Jack Teague (305) 293 7511	***BASIS:*** 1	***TOTAL:*** $1,060,000	
LEAD ORGANIZATION(S): DOH		***APPROPRIATED TO DATE:*** DOH $500,000	
SUPPORTING ORGANIZATION(S): USEPA		EPA $560,000	
COUNTY(S): Monroe		***TOTAL:*** $1,060,000	
		REMAINING FINANCIAL REQUIREMENT: $0	
LINKED PROJECTS: **Dependent on:** **Critical to:** FK21 **Associated with:** FK17, FK18		***TOTAL:*** $0	
START: Project Underway 9/96	***END:*** 1998	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The purpose of this project is to establish the capabilities of known on-site sewage disposal system (OSDS) technologies to consistently meet an established nutrient effluent standard. Effective 1 July 1993 Chapter 381.0065, F.S. only permits the use of OSDS in the Keys which are capable of meeting the AWT effluent standard (Chapter 403.086, F.S.) Prior to the adoption of this effluent standard, there had been no specific nutrient standard for OSDS. Thus, there was no Institutional knowledge or experience with any OSDS technologies regarding their capacity to meet a nutrient standard. Five technologies, were chosen for the demonstration and testing phases of the project. Four are aerobic treatment units and one consists of a standard septic tank configuration with a drip irrigation component. The systems and their components are connected in such a ways that components may be mixed among systems to achieve the most efficient system for nutrient removal possible.

This project was intended to be a one year effort. It has been extended an additional year to determine if nutrient removal efficiencies change with the age of the system. Additionally, project managers can better establish how fast certain components of the systems will load with nutrients, and therefore, determine how often these components will have to changed or recharged.

RESTORATION BENEFITS:

As these systems are completely tested, are approved for use in Chapter 10D-6, Part II, and become available for general use, significant reductions in nutrient loading will occur.

This is one of a number of efforts under way currently to improve wastewater treatment technologies in the Keys. The Sanitary Wastewater Master Plan (SWMP) for the Keys will prioritize improvements overall, making recommendations as to the most economically and environmental efficient systems throughout the Keys. The SWMP project team will rely heavily on the information from this project before making any recommendations as to the best systems, mix of systems, or institutional approaches to managing wastewater in the Keys.

Time Line and Fiscal Year Budget (in thousands of dollars) for Florida Keys Nutrient Feasibility Study

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Research																
Project																
State	500															500
EPA	560															560
Subtotal	1060															**$1,060**

TITLE: Florida Keys Stormwater Master Plan			
SUBREGION : 6	***PROJECT ID:*** FK16	***FINANCIAL REQUIREMENT:*** cost-share (proposed)	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Water Quality	Local $500,000 Estimates only State 1,500,000	
PROJECT PLAN MANAGER: George Garrett 305-289-2500	***BASIS:*** 1	***TOTAL:*** $2,000,000	
LEAD ORGANIZATION(S): Monroe County		***APPROPRIATED TO DATE:*** SFWMD $50,000 Monroe 50,000	
SUPPORTING ORGANIZATION(S): SFWMD, EOG			
COUNTY(S): Monroe		***TOTAL:*** $100,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** FK15 **Associated with:** FK18		***REMAINING FINANCIAL REQUIREMENT:*** Local $450,000 State 1,450,000 ***TOTAL:*** $1,900,000	
START: Project Underway 8/97	***END:*** 2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The project is required as part of the implementation of Monroe County's 2010 Comprehensive Plan. The Comprehensive Plan received its final adoption by the Governor and Cabinet in July of 1997, including portions requiring the Stormwater Master Plan. In 1996, related to earlier adoption of the majority of the Comprehensive Plan, the Governor issued Executive Order 96-108 which requires that appropriate state agencies assist Monroe County in the development of this and other critical components of the Comprehensive Plan. This project will develop a stormwater master plan that will be used as the long range planning tool to allow comprehensive improvement in the treatment and better management of stormwater in the Florida Keys.

The initial phase of the project will involve writing a thorough Scope of Work for developing the Stormwater Master Plan. Current funding appropriations will allow Monroe County to accomplish this goal. The second phase of the project will involve soliciting for and hiring a firm to develop the stormwater master plan. Implementation is expected to begin some years later. It is expected to require one year or more to complete the Request for Qualifications process and to acquire necessary funds to carry out this planning effort. Development of the master plan could take as long as two years.

RESTORATION BENEFITS: Stormwater management in the Keys is limited to the development of swale systems to retain or detain stormwater and the installation of such amenities as French drains. Very little comprehensive stormwater management exists. Unfortunately, most systems take advantage of the rapid tranmissivity of the Keys native geology which allows for very quick transport of groundwaters to confined and nearshore waters. This project will assist in providing comprehensive modifications to stormwater practices in the Keys. Over 40 percent of the nitrogen load from the Keys comes from stormwater and nearly as significant a proportion of phosphorous comes from stormwater as well. Stormwater is not nearly as well managed as the other principal contributor, wastewater. Many of the improvements to existing stormwater systems will inevitably need to occur on State and County road networks. Improvements to stormwater management systems will improve the quality of confined and nearshore waters.

Time Line and Fiscal Year Budget (in thousands of dollars) for Florida Keys Stormwater Master Plan

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Scope of Work	■	■														
Master Plan			■	■	■											
Project																
State		50	317	317	316											1,000
County		50	317	317	316											1,000
Subtotal		50	634	634	632											**$2,000**

TITLE: Florida Keys Sanitary Wastewater Master Plan			
SUBREGION : 6	***PROJECT ID:*** FK17	***FINANCIAL REQUIREMENT:*** cost-share (proposed)	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Management	Local $500,000 State $1,700,146 ***TOTAL:*** $2,200,146	
PROJECT PLAN MANAGER: George Garrett 305-289-2507	***BASIS:*** 1	***APPROPRIATED TO DATE:*** SFWMD $999,970 FDEP $125,000 Monroe $500,000 ***TOTAL:*** $1,624,970	
LEAD ORGANIZATION(S): Monroe County			
SUPPORTING ORGANIZATION(S): SFWMD, FDEP,DCA, Governor's Office			
COUNTY(S): Monroe		***REMAINING FINANCIAL REQUIREMENT:*** State $575,176	
LINKED PROJECTS: **Dependent on:** **Critical to:** FK14, FK18 **Associated with:** FK17		***TOTAL:*** $575,176	
START: Project Underway 8/97	***END:*** 1999	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The project is required as part of the implementation of Monroe County's 2010 Comprehensive Plan. The Comprehensive Plan received its final adoption by the Governor and Cabinet in July of 1997, including portions requiring the Sanitary Wastewater Master Plan. In 1996, related to earlier adoption of the majority of the Comprehensive Plan, the Governor issued Executive Order 96-108 which requires that appropriate state agencies assist Monroe County in the development of this and other critical components of the Comprehensive Plan. This project will develop a wastewater master plan that will be used as the long range planning tool to allow comprehensive improvement and better management wastewater treatment in the Florida Keys.

RESTORATION BENEFITS: Approximately 29,000 residential and commercial units in the Florida Keys are served by On-Site Sewage Disposal Systems (OSDS), approximately 500 of which are aerobic treatment units (ATUs) which inject effluent to a Class V well. Over 9,000 of theses systems are unpermitted (probably cesspits) and there are an undetermined number of malfunctioning permitted OSDS. There are an additional 350 (±) wastewater treatment plants in the Keys which also inject effluent to a Class V well. Studies have shown that contamination from OSDS wastewater enters canals and nearshore waters very rapidly, sometimes in as little as 12 hours. These sources represent critical threats to the long term ecological health of the Keys, particularly in nearshore and confined waters.

Monroe County has approved a contract for $2.2 million which began 1 August 1997 and will be complete at the end of September 1999. The project will result in an information base upon which informed development and infrastructure investments can be made. The implementing agency will most likely be the Florida Keys Aqueduct Authority (FKAA) which will use the Plan to begin immediate phased construction in those areas considered to warrant wastewater collection systems. It is yet to be determined whether they will also manage improved and invariably more complex on-site systems. The result will provide an approach to improving water quality through a comprehensive and cost effective wastewater management plan.

Collaborative efforts include an OSDS inspection and five year renewable licensing effort being implemented by Monroe County and DOH designed to ensure that cesspits are eliminated immediately and that permitted systems are functioning properly. In addition, DOH is undertaking an effort which will be complete in the Fall of 1997 to investigate OSDS with significant capability to strip nutrients. Ultimately, these systems will be required by DOH, as the Best Available Technology (BAT), in place of the septic tanks and ATUs that are currently permitted.

Time Line and Fiscal Year Budget (in thousands of dollars) for Marathon Community Wastewater Treatment Plant																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Master Plan																
Project																
FDCA		575														
Subtotal		575														**$575**

TITLE: Florida Keys National Marine Sanctuary Water Quality Protection Program			
SUBREGION : 8	***PROJECT ID:*** FK18	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Research	***TOTAL:*** $5,800,000 for first five years	
PROJECT PLAN MANAGER: McManus (404) 562-9385	***BASIS:*** 2	***APPROPRIATED TO DATE:***	
LEAD ORGANIZATION(S): USEPA		EPA: 1995 $1,458,200 1996 $1,861,000 1997 $1,560,000 TOTAL: $3,475,200	
SUPPORTING ORGANIZATION(S): NOAA, FDEP, SFWMD, Monroe County, FDCA, FDOH, NPS			
COUNTY(S): Monroe		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to:** FK14, FK15, FK16, FK17 **Associated with:** FK28		***TOTAL:*** $2,324,8000 for next two years	
START: 1995	***END:*** 1999	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: : EPA and the State of Florida , in consultation with NOAA, developed the Water Quality Protection Program (WQPP) for the Florida Keys National Marine Sanctuary. The purpose of the WQPP is to recommend priority corrective actions and compliance schedules addressing point and nonpoint sources of pollution to restore and maintain the chemical, physical, and biological integrity of the Sanctuary. A WQPP Document (September 1996) describes the suite of activities that must be performed to fulfill the goals of the Program. Those activities include, but are not limited to, wastewater and stormwater demonstration projects, comprehensive water quality, seagrass, and hard bottom monitoring, and special studies. Special studies are addressing the role of Florida Bay and land-based sources in water quality, movement and nutrient dynamics of wastewater injected into the groundwater in the Keys, human health concerns in residential canals, coral diseases, and effects of mosquito spraying on nontarget organisms. The WQPP is a long term program and the financial requirements reflect the first five years of this effort.

RESTORATION BENEFITS: The WQPP will restore and maintain a balanced, indigenous population of corals, shellfish, and wildlife in Sanctuary waters

Time Line and Fiscal Year Budget (in thousands of dollars) for Florida Keys National Marine Sanctuary Water Quality Protection Program

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
EPA	1560															$3475.2
Subtotal	1560															**$3475.2**

TITLE: Marathon Community Wastewater Treatment Plant			
SUBREGION : 6	***PROJECT ID:*** FK19	***FINANCIAL REQUIREMENT:*** cost-share (proposed)	
PROGRAM CATEGORY: Infrastructure	***BUDGET CATEGORY:*** Infrastructure	State Federal	
PROJECT PLAN MANAGER: George Garrett 305-289-2507	***BASIS:*** 1	***TOTAL:*** $70,000,000 (estimated)	
LEAD ORGANIZATION(S): Monroe County		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): FDEP,DCA		FDEP $314,000	
COUNTY(S): Monroe		***TOTAL:*** $314,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** FK17, FK18 **Associated with:**		***TOTAL:*** $70,000,000	
START: 2000	***END:*** 2004	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Development of detailed engineering design/plans and construction of a wastewater collection and treatment system in the Marathon area of Monroe County. System capacity is about 2 million gallons per day.

RESTORATION BENEFITS: To significantly reduce nutrient loadings to confined and nearshore waters of the Marathon area by providing advanced wastewater treatment. This action should restore and maintain the water quality and biological resources of the area. The process of coastal eutrophication would be retarded and possibly eliminated in certain areas.

Time Line and Fiscal Year Budget (in thousands of dollars) for Marathon Community Wastewater Treatment Plant																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Planning/design	■	■	■													
Construction				■	■	■	■	■								
Project																
Monroe Co., Govn's Office																70,000
Subtotal																**$70,000**

TITLE: Florida Keys Cesspit Identification and Elimination Program - Administrative Funding			
SUBREGION : 6	***PROJECT ID:*** FK21	***FINANCIAL REQUIREMENT:*** cost-share (proposed)	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Water Quality	Local 500,000 State 500,000	
PROJECT PLAN MANAGER: Jack Teague 305-293 7511	***BASIS:*** 1	***TOTAL:*** $1,000,000	
LEAD ORGANIZATION(S): DOH		***APPROPRIATED TO DATE:*** Monroe 500,000	
SUPPORTING ORGANIZATION(S): Monroe County, EOG		EOG 500,000	
COUNTY(S): Monroe		***TOTAL:*** $1,000,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** FK14, FK18 **Associated with:** FK17		***REMAINING FINANCIAL REQUIREMENT:*** State $0 ***TOTAL:*** $0	
START: Project Underway 2/97	***END:*** 2007	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The cesspit identification and elimination program is required as part of the implementation of Monroe Countyís 2010 Comprehensive Plan. The Comprehensive Plan received its final adoption by the Governor and Cabinet in July of 1997. Approximately 29,000 residential and commercial units in the Florida Keys are served by On-Site Sewage Disposal Systems (OSDS). Over 9,000 of these systems have no known permit history. Monroe County adopted Ordinance 03-1997 early in 1997, which requires the inspection of all on-site systems by the year 2007. In the first five years, the program will focus on the inspection of those systems with no known permits. Inspections of older properties will be conducted first, with successively newer properties inspected in succeeding years. Many properties will contain cesspits and these will be required to be replaced immediately. Non functioning permitted systems will be required to be upgraded or replaced as well, dependent on the condition of the system. Each property owner with a functioning and permitted system will receive a five year renewable operating permit for the system on their property. After the initial ten year period, during which all systems will be inspected for the first time, a program requiring five year operating permit renewals will remain in place indefinitely. The cesspit identification and elimination program was adopted by the Monroe County Board of Commissioners and is being implemented primarily by DOH, and to a lesser degree by FDEP, through a Memorandum of Understanding between Monroe County, DOH, FDEP, and the Executive Office of the Governor.

Significant costs are associated with initiating a new program such as this. In its inaugural year, the program was funded through the efforts of the Executive Office of the Governor (EOG). The EOG placed $500,000 in the legislative budget to carry out the first phase of the program. Remaining funding dollars will be obtained from application fees for the initial inspection phase of the project and later from the approval of new operating permits as they come due each five years.

RESTORATION BENEFITS:

Implementation of the cesspit identification and elimination program will assist in the reduction of the nutrient load of such systems to Keysí ground, confined, and nearshore waters. Nutrient loading has been identified as one of the major impacts resulting from existing and future development in the Keys. Though stormwater is also a significant contributor to overall loading, the majority emanates from wastewater systems. The majority of the wastewater loading outside of the City of Key West comes from on-site systems. Since cesspits, unit for unit, are the worst contributors to the nutrient loading problem, they have been targeted first. Efforts underway with the Monroe County Sanitary Wastewater Master Plan will provide a more comprehensive and long term view of potential solutions to the nutrient loading problem.

Time Line and Fiscal Year Budget (in thousands of dollars) for Florida Keys Cesspit Identification and Elimination Program - Administrative Funding																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Project																
EOG	500															500
Local DOH		250	250													500
Subtotal																**$1,000**

TITLE: Florida Keys Tidal Creek Restoration Project			
SUBREGION : 8	***PROJECT ID:*** FK28	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Research		
PROJECT PLAN MANAGER: R.J. Hebling (305) 289-2310	***BASIS:*** 1,2	***TOTAL:*** $1,224.000	
LEAD ORGANIZATION(S): USEPA		***APPROPRIATED TO DATE:*** FDEP $250,000	
SUPPORTING ORGANIZATION(S): NOAA, EPA, SFWMD, Monroe County, FDCA, FDOT			
COUNTY(S): Monroe		TOTAL: $250,000	
LINKED PROJECTS: **Dependent on:** **Critical to**: FK18 **Associated with:**		***REMAINING FINANCIAL REQUIREMENT:*** ***TOTAL:*** $1,200,000	
START: 1998	***END:*** 2000	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project will restore historic flow ways between the Atlantic Ocean and the Gulf of Mexico which were blocked during construction of Highway U.S. 1. An existing tidal creek restoration project in the vicinity of the proposed restoration projects was fully successful. Three tidal creeks in the vicinity of Marathon, Florida have been selected for restoration. Culverts will be located and sized to maximize flow and placed under U.S. 1 to allow tidal exchange and flushing. Sites of the three flow ways to be restored are: Tarpon Creek, Fat Deer Key (MM 54), unnamed flow way between Fat Deer Key and Long Point Key (MM56), and unnamed creek at Little Crawl Key (MM57). Monitoring of water quality, benthic community composition, and sediment particle size will be performed before construction and 0.5 and 1 year after construction. Additional tidal flow way restoration projects will be identified in the future based upon results of these three initial restoration projects.

RESTORATION BENEFITS: It is fully anticipated that adequate culverting will improve circulation and tidal flushing of the currently blocked flow ways. Flushing will remove accumulated organic matter which has collected in the upper reaches of the impounded creeks. Increased flushing and circulation will result in improved water quality and habitat value of the tidal creek habitats.

Time Line and Fiscal Year Budget (in thousands of dollars) for Florida Keys Tidal Creek Restoration Project

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Construction																
Monitoring																
Project																
FDEP		250														
Subtotal		250														**$250**

TITLE: Florida Keys Cesspit Identification and Elimination Program - Financial Assistance to Citizens			
SUBREGION : 6	***PROJECT ID:*** FK29	***FINANCIAL REQUIREMENT:*** cost-share (proposed) Federal $1,000,000 Local $100,000 State $1,100,000 ***TOTAL:*** $2,200,000	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Water Quality		
PROJECT PLAN MANAGER: Roger Braun 305-296 5621	***BASIS:***	***APPROPRIATED TO DATE:*** FDCA $1,000,000 EOG 100,000 Monroe 100,000 ***TOTAL:*** $1,200,000	
LEAD ORGANIZATION(S): Monroe County Public Housing Authority			
SUPPORTING ORGANIZATION(S): Monroe County, DOH, DEP, DCA, EOG			
COUNTY(S): Monroe		***REMAINING FINANCIAL REQUIREMENT:*** Federal $1,000,000 ***TOTAL:*** $1,000,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** FK17			
START: Project Underway 2/97	***END:*** 2007	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The cesspit identification and elimination program is required as part of the implementation of Monroe Countyís 2010 Comprehensive Plan. The Comprehensive Plan received its final adoption by the Governor and Cabinet in July of 1997. Approximately 29,000 residential and commercial units in the Florida Keys are served by On-Site Sewage Disposal Systems (OSDS). Over 9,000 of theses systems have no known permit history. Monroe County adopted Ordinance 03-1997 early in 1997, which requires the inspection of all on-site systems by the year 2007. In the first five years, the program will concentrate on the inspection of those systems with no known permits. Inspections are required of older properties first and then of successively newer properties in succeeding years. Many properties will contain cesspits and these will be required to be replaced immediately. Non functioning permitted systems will be required to be upgraded or replaced as well, dependent on the condition of the system. Each property owner with a functioning and permitted system will receive a five year renewable operating permit for the system on their property. Thus, after the initial ten year period, during which all systems will be inspected for the first time, a program requiring five year operating permit renewals will remain in place indefinitely. The cesspit identification and elimination program was adopted by the Monroe County Board of Commissioners and is being implemented primarily by DOH, and to a lesser degree by FDEP, through a Memorandum of Understanding between Monroe County, DOH, FDEP, and the Executive Office of the Governor.

Significant concerns exist about the affordability of this program. Basic program fees and inspection costs will range from $300 to $1,000, based on current DOH and industry estimates. The actual cost of replacement when necessary has been estimated at $7,500 to $10,000 per unit. The County, working with FDCA, the Executive Office of the Governor, and the Monroe County Housing Authority has established a financing program for low and very low income residents. They are working on a similar program for moderate income residents.

RESTORATION BENEFITS: Implementation of the cesspit identification and elimination program will assist in the reduction of the nutrient load of such systems to Keysí ground, confined, and nearshore waters. Nutrient loading has been identified as one of the major impacts resulting from existing and future development in the Keys. Though stormwater is also a significant contributor to overall loading, the majority emanates from wastewater systems. The majority of the wastewater loading outside of the City of Key West comes from on-site systems. Since cesspits, unit for unit, are the worst contributors to the nutrient loading problem, they have been targeted first. Efforts underway with the Monroe County Sanitary Wastewater Master Plan will provide a more comprehensive and long term view of potential solutions to the nutrient loading problem.

Time Line and Fiscal Year Budget (in thousands of dollars) for Florida Keys Cesspit Identification and Elimination Program - Financial Assistance for Citizens																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Project																
Monroe		100														100
EOG		100														100
FDCA		1,000														1,000
Federal		1,000														1,000
Subtotal		2,200														**$2,200**

TITLE: Florida Keys Channel Marking Master Plan			
SUBREGION : 6	***PROJECT ID:*** FK30	***FINANCIAL REQUIREMENT:*** cost-share (proposed)	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Habitat Protection	Local $585,000 State $35,000	
PROJECT PLAN MANAGER: George Garrett 305-289-2507	***BASIS:***	***TOTAL:*** $620,000	
LEAD ORGANIZATION(S): Monroe County		***APPROPRIATED TO DATE:*** FDEP $35,000 Monroe $35,000	
SUPPORTING ORGANIZATION(S): FDEP, FKNMS		***TOTAL:*** $70,000	
COUNTY(S): Monroe		***REMAINING FINANCIAL REQUIREMENT:*** Monroe $550,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $550,000	
START: Project Underway 2/97	***END:*** 2002	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Over the past years resource managers, regulatory personnel, and enforcement officers have watched as large areas of the Keys' shallow seagrass meadows and algal flats have been damaged by boaters who inadvertently or intentional cross them.

Based on surveys conducted through the Florida Marine Research Institute (FMRI), the total area of damage resulting from prop scarring exceeds 30,000 acres in Monroe County (FMRI Technical Report TR-1). Damage ranges from light (14,560 acres) to moderate (10,430 acres) to severe (5060 acres).

A four point approach for managing shallow water resource damage was developed in the Florida Keys and is represented in the FMRI work noted above. One approach is channel marking. This project will develop the channel marking component of the four point approach. Through the planning phase, the County has identified the need for approximately 300 new navigational aids. The installation phase of the project will require three to five years predicated on funding availability (Boating Improvement Fund).

Channel marking is identified as one of ten critical action plans in the Management Plan for the Florida Keys National Marine Sanctuary. The County wrote the action plan and will take the lead in implementing it. However, the fact that it is identified and considered so highly by the FKNMS indicates the importance of this effort in the context of overall habitat restoration in the Florida Keys.

RESTORATION BENEFITS: The result of the plan and implementation, through actual marking, will be a reduction of new shallow water damage and an improvement in currently damaged areas. The implementation of the four point approach is critical, however, to the complete success of the program The other components are education, enforcement, and the use of restrictive zoning.

Time Line and Fiscal Year Budget (in thousands of dollars) for Florida Keys Channel Marking Master Plan

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Marking Plan	■	■	■	■	■	■										
Project																
Monroe	35	110	110	110	110	110										585
FDEP	35															35
Subtotal																**$620**

TITLE: Florida Keys Invasive Exotic Plant Control Strategy			
SUBREGION : 6	***PROJECT ID:*** FK31	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Management		
PROJECT PLAN MANAGER: Stieglitz (305) 872-2239	***BASIS:*** 1, 2	***TOTAL:*** $4,190,000	
LEAD ORGANIZATION(S): USFWS		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): TNC, FAS, FDOT, GFC, FDEP, Monroe County			
COUNTY(S): Monroe		***TOTAL:*** $0	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** TS19, FK14		***TOTAL:*** **$**190,000	
START: 1998	***END:*** 2000	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project will gather, synthesize and distribute critical data on the extent, distribution and treatment of harmful, non-indigenous plant species in the Florida Keys. This information will meet needs identified in the 1996 publication *South Florida Restoration: Scientific Needs* for the Florida Keys related to harmful non-indigenous plant species.

The Florida Keys Invasive Exotics Task Force has completed a Keys-wide survey of exotic plant distribution with participation from its members, which include the Florida Audobon Society; Florida Departments of Community Affairs, Environmental Protection, and Transportation; Florida Game and Freshwater Fish Commission; Monroe County; Key Deer Protection Alliance; The Nature Conservancy; Lewis Environmental Services; and the U.S. Fish and Wildlife Service. This project will capitalize on the information collected by these agencies by integrating, synthesizing and distributing the information, then testing it through demonstration projects.

Funding for this project will allow the completion of (a) research into Best Management Practices (BMP's) for leadtree, (b) investigations of the biological agent responsible for a mysterious die-off of Australian Pines in the Florida mKeys (to identify another biological control agent that could be used elsewhere in South Florida), (c) demonstration projects of BMP's for revegetation of sites that have been cleared of exotic vegetation, and (d) monitoring of plant eradication projects currently being conducted by federal, state, local, and non-governmental agencies and organizations. All of these efforts are consistent with the recommendations of the Florida Keys Invasive Exotic Task Force and will provide a major contribution to exotic plant control in the Florida Keys.

RESTORATION BENEFITS: The identification and ultimate removal of exotic vegetation currently degrading the globally-endangered pine rocklands and tropical hardwood hammocks will restore the healthy functioning of these communities and increase their ability to restore and maintain the native flora and fauna of the Florida Keys, increase the carrying capacity of the Florida Keys for native species, contribute to the recovery of endangered and threatened species (a critical element of the Multi-Species Recovery Strategy), Maintain wildlife corridors in productive native habitats, and restore natural system functions. For instance, indicator species identified by the Science Sub-Group, including the Florida *(Liguus)* Tree Snail and White-Crowned Pigeon, will benefit directly as a result of this project through habitat restoration.

Time Line and Fiscal Year Budget (in thousands of dollars) for Florida Keys Nutrient Feasibility Study																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Preparation & implement		[redacted]														
Project																
USFWS		(TBD)	(TBD)	(TBD)												$190
Subtotal																**$190**

TITLE: Florida Keys Multi- Species Habitat Conservation Plan			
SUBREGION : 6	***PROJECT ID:*** FK32	***FINANCIAL REQUIREMENT:*** DCA $250,000	
PROGRAM CATEGORY: Science	***BUDGET CATEGORY:*** Habitat Protection	***TOTAL:*** $250,000	
PROJECT PLAN MANAGER: Symroski 305/289-2402	***BASIS:*** 1,2	***APPROPRIATED TO DATE:***	
LEAD ORGANIZATION(S): FDCA		TOTAL: $0	
SUPPORTING ORGANIZATION(S): Monroe County, USFWS			
COUNTY(S): Monroe		***REMAINING FINANCIAL REQUIREMENT:***	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:** TS19, FK14		***TOTAL:*** $250,000	
START: FY99	***END:*** FY00	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: This project will synthesize the existing information on the endangered and threatened species in the lower Florida Keys, focusing on the Key deer and develop a Habitat Conservation Plan which will be used to recover imperiled species and guide growth and development. Much of the data necessary for development of this HCP is in existence, but requires careful collection and assemblage in the light of the public to derive a meaningful plan which will settle issues related to the needs of wildlife and humans co-existing in the Lower Keys. Funding is required to complete this important project.

RESTORATION BENEFITS: The HCP will address the recovery needs of not only the well-known endangered Key deer, but protection and preservation of two globally endangered plant communities in which they live and a host of other imperiled species which also depend upon these same habitats, including the white-crowned pigeon, liguus tree snail, Keys tree cactus, and Garber's spurge. These recovery benefits will directly contribute to the objectives and goals of the Multi-Species Recovery Strategy and bear upon the Florida Keys Carrying Capacity Study.

Time Line and Fiscal Year Budget (in thousands of dollars) for Florida Keys Multi- Species Habitat Conservation Plan																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Develop Plan																
Project																
DCA			150	100												250
Subtotal			150	100												**$250**

TITLE: Florida Keys National Marine Sanctuary: Level I monitoring of ecosystem structure and function			
SUBREGION : 6	***PROJECT ID:*** FK33	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Monitoring	NOAA: $1,100,000	
PROJECT PLAN MANAGER: Haskell (305) 743-2437	***BASIS:*** 2	***TOTAL:*** $1,100,000	
LEAD ORGANIZATION(S): NOAA		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): Florida DEP/FMRI			
COUNTY(S): Monroe		***TOTAL:*** $200,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***REMAINING FINANCIAL REQUIREMENT:***	
		TOTAL: $900,000	
START: 1997	***END:*** 9/30/02	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: On July 1, 1997 NOAA and the State of Florida implemented the Nation's first large-scale marine zoning plan. Marine zoning is being implemented in the Florida Keys National Marine Sanctuary (FKNMS) to protect the biological diversity and integrity of the marine environment in the Keys. Results of the monitoring program will be used in 5 years (year 2002) by Sanctuary managers to evaluate the zones' effectiveness in protecting marine biodiversity and, who will, based in part on that evaluation, determine the future use of zoning as a management tool. The effect of the zones will be determined by monitoring changes inside and outside of the no-take areas.

The primary purpose of the monitoring in the first five years will be to test the following hypotheses: 1) The abundance and average size of most exploited fish species will change significantly as a result of the no-take zones; 2) the abundance, average size, and size range of spiny lobster will change significantly as a result of the no-take zones; 3) the abundance of some mobile and sessile invertebrates, other than coral, will change significantly as a result of the no-take zones; and 4) the physical impacts from visitors will change significantly.

A hierarchical monitoring approach will be used consisting of the following three levels: Level I will focus on changes in ecosystem structure and function in the two largest zones and one research-only area where diving is prohibited, Level II will focus on changes in ecosystem structure (species abundances) and on changes in human activities and attitudes in the smaller no-take zones, and Level III will focus on changes in overall ecosystem health using volunteers in all of the zones.

This proposal addresses the Level I monitoring of changes in the structure (corals, sponges, macroalgae, mobile invertebrates) and function (coral recruitment and grazing) of the benthic community in the two largest no-take zones and one research-only area for the purpose of determining the effects of the zones.

RESTORATION BENEFITS: The Florida Keys National Marine Sanctuary represents the final downstream component of the South Florida ecosystem. As such it is essential to monitor biological and socioeconomic changes in the Sanctuary now while changes to the delivery of water quality and quantity are being made upstream. The Sanctuary's zone monitoring program will: 1) Provide monitoring of indicators of restoration effects, 2) contribute to a better understanding of the dynamics of the coastal ecosystem (region 6), and 3) provide information for a report card on the health of the South Florida ecosystem.

Time Line and Fiscal Year Budget (in thousands of dollars) for FKNMS Level I Monitoring																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
NOAA	200	200	200	200	200	100										1,100
Subtotal	200	200	200	200	200	100										**$1,100**

TITLE: Florida Keys National Marine Sanctuary: Level II Sentinel Fisheries Program			
SUBREGION : 6	***PROJECT ID:*** FK34	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Monitoring	NOAA: $128 ,000	
PROJECT PLAN MANAGER: Haskell (305) 743-2437	***BASIS:*** 2	***TOTAL:*** $128 ,000	
LEAD ORGANIZATION(S): NOAA		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): Florida Sea Grant and Monroe County Cooperative Extension Service			
COUNTY(S): Monroe		***TOTAL:*** $18,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $110,000	
START: 1997	***END:*** 9/30/02	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: On July 1, 1997 NOAA and the State of Florida implemented the Nation's first large-scale marine zoning plan. Marine zoning is being implemented in the Florida Keys National Marine Sanctuary (FKNMS) to protect the biological diversity and integrity of the marine environment in the Keys. Results of the monitoring program will be used in 5 years (year 2002) by Sanctuary managers to evaluate the zones' effectiveness in protecting marine biodiversity and, who will, based in part on that evaluation, determine the future use of zoning as a management tool. The effect of the zones will be determined by monitoring changes inside and outside of the no-take areas.

The primary purpose of the monitoring in the first five years will be to test the following hypotheses: 1) The abundance and average size of most exploited fish species will change significantly as a result of the no-take zones; 2) the abundance, average size, and size range of spiny lobster will change significantly as a result of the no-take zones; 3) the abundance of some mobile and sessile invertebrates, other than coral, will change significantly as a result of the no-take zones; and 4) the physical impacts from visitors will change significantly.

A hierarchical monitoring approach will be used consisting of the following three levels: Level I will focus on changes in ecosystem structure and function in the two largest zones and one research-only area where diving is prohibited, Level II will focus on changes in ecosystem structure (species abundances) and on changes in human activities and attitudes in the smaller no-take zones, and Level III will focus on changes in overall ecosystem health using volunteers in all of the zones.

This proposal addresses Level II monitoring of the changes in the spiny lobster fishery due to the effects of the Western Sambos ecological reserve. Local fishermen will be used to collect data on catch-per-unit-effort both inside and outside the reserve so they can see, first hand, what effects the zone is having on the fishery.

RESTORATION BENEFITS: The Florida Keys National Marine Sanctuary represents the final downstream component of the South Florida ecosystem. As such it is essential to monitor biological and socioeconomic changes in the Sanctuary now while changes to the delivery of water quality and quantity are being made upstream. The Sanctuary's zone monitoring program will: 1) Provide monitoring of indicators of restoration effects, 2) contribute to a better understanding of the dynamics of the coastal ecosystem (region 6), and 3) provide information for a report card on the health of the South Florida ecosystem.

Time Line and Fiscal Year Budget (in thousands of dollars) for FKNMS Level I Monitoring																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
NOAA	18	20	20	30	30	10										128
Subtotal	18	20	20	30	30	10										**$128**

TITLE: Florida Keys National Marine Sanctuary: Level II monitoring for lobster/conch			
SUBREGION : 6	***PROJECT ID:*** FK35	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Monitoring	NOAA: $195,000	
PROJECT PLAN MANAGER: Haskell (305) 743-2437	***BASIS:*** 2	***TOTAL:*** $195,000	
LEAD ORGANIZATION(S): NOAA		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): Florida DEP/FMRI			
COUNTY(S): Monroe		***TOTAL:*** $30,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $165,000	
START: 1997	***END:*** 9/30/02	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: On July 1, 1997 NOAA and the State of Florida implemented the Nation's first large-scale marine zoning plan. Marine zoning is being implemented in the Florida Keys National Marine Sanctuary (FKNMS) to protect the biological diversity and integrity of the marine environment in the Keys. Results of the monitoring program will be used in 5 years (year 2002) by Sanctuary managers to evaluate the zones' effectiveness in protecting marine biodiversity and, who will, based in part on that evaluation, determine the future use of zoning as a management tool. The effect of the zones will be determined by monitoring changes inside and outside of the no-take areas.

The primary purpose of the monitoring in the first five years will be to test the following hypotheses: 1) The abundance and average size of most exploited fish species will change significantly as a result of the no-take zones; 2) the abundance, average size, and size range of spiny lobster will change significantly as a result of the no-take zones; 3) the abundance of some mobile and sessile invertebrates, other than coral, will change significantly as a result of the no-take zones; and 4) the physical impacts from visitors will change significantly.

A hierarchical monitoring approach will be used consisting of the following three levels: Level I will focus on changes in ecosystem structure and function in the two largest zones and one research-only area where diving is prohibited, Level II will focus on changes in ecosystem structure (species abundances) and on changes in human activities and attitudes in the smaller no-take zones, and Level III will focus on changes in overall ecosystem health using volunteers in all of the zones.

This proposal addresses the Level II monitoring of changes in lobster and conch populations in 15 of the 23 no-take zones for the purpose of determining the effects of the zones.

RESTORATION BENEFITS: The Florida Keys National Marine Sanctuary represents the final downstream component of the South Florida ecosystem. As such it is essential to monitor biological and socioeconomic changes in the Sanctuary now while changes to the delivery of water quality and quantity are being made upstream. The Sanctuary's zone monitoring program will: 1) Provide monitoring of indicators of restoration effects, 2) contribute to a better understanding of the dynamics of the coastal ecosystem (region 6), and 3) provide information for a report card on the health of the South Florida ecosystem.

Time Line and Fiscal Year Budget (in thousands of dollars) for FKNMS Level I monitoring																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
NOAA	30	35	35	35	35	20										560
Subtotal																**$1,060**

TITLE: Florida Keys National Marine Sanctuary: Level II Rapid Assessment			
SUBREGION : 6	***PROJECT ID:*** FK36	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Monitoring	NOAA: $200,000	
PROJECT PLAN MANAGER: Haskell (305) 743-2437	***BASIS:*** 2	***TOTAL:*** $200,000	
LEAD ORGANIZATION(S): NOAA		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): National Undersea Research Center			
COUNTY(S): Monroe		***TOTAL:*** $40,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $160,000	
START: 1997	***END:*** 9/30/02	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: On July 1, 1997 NOAA and the State of Florida implemented the Nation's first large-scale marine zoning plan. Marine zoning is being implemented in the Florida Keys National Marine Sanctuary (FKNMS) to protect the biological diversity and integrity of the marine environment in the Keys. Results of the monitoring program will be used in 5 years (year 2002) by Sanctuary managers to evaluate the zones' effectiveness in protecting marine biodiversity and, who will, based in part on that evaluation, determine the future use of zoning as a management tool. The effect of the zones will be determined by monitoring changes inside and outside of the no-take areas.

The primary purpose of the monitoring in the first five years will be to test the following hypotheses: 1) The abundance and average size of most exploited fish species will change significantly as a result of the no-take zones; 2) the abundance, average size, and size range of spiny lobster will change significantly as a result of the no-take zones; 3) the abundance of some mobile and sessile invertebrates, other than coral, will change significantly as a result of the no-take zones; and 4) the physical impacts from visitors will change significantly.

A hierarchical monitoring approach will be used consisting of the following three levels: Level I will focus on changes in ecosystem structure and function in the two largest zones and one research-only area where diving is prohibited, Level II will focus on changes in ecosystem structure (species abundances) and on changes in human activities and attitudes in the smaller no-take zones, and Level III will focus on changes in overall ecosystem health using volunteers in all of the zones.

This proposal addresses Level II monitoring of 16 of the no-take zones using a rapid assessment approach whereby a team of coral reef ecologists will collect quantitative and qualitative consistently year-after-year in order to provide a snapshot of reef health in the zones.

RESTORATION BENEFITS: The Florida Keys National Marine Sanctuary represents the final downstream component of the South Florida ecosystem. As such it is essential to monitor biological and socioeconomic changes in the Sanctuary now while changes to the delivery of water quality and quantity are being made upstream. The Sanctuary's zone monitoring program will: 1) Provide monitoring of indicators of restoration effects, 2) contribute to a better understanding of the dynamics of the coastal ecosystem (region 6), and 3) provide information for a report card on the health of the South Florida ecosystem.

Time Line and Fiscal Year Budget (in thousands of dollars) for FKNMS Level I Monitoring																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
NOAA	40	40	40	40	40											200,000
Subtotal																**$200,000**

TITLE: Florida Keys National Marine Sanctuary: Level II Human Activities Assessment			
SUBREGION : 6	***PROJECT ID:*** FK37	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Monitoring	NOAA: $1,050,000	
PROJECT PLAN MANAGER: Haskell (305) 743-2437	***BASIS:*** 2	***TOTAL:*** $1,050,000	
LEAD ORGANIZATION(S): NOAA		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): Florida DEP/FMRI			
COUNTY(S): Monroe		***TOTAL:*** $50,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $1,000,000	
START: 1997	***END:*** 9/30/02	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: On July 1, 1997 NOAA and the State of Florida implemented the Nation's first large-scale marine zoning plan. Marine zoning is being implemented in the Florida Keys National Marine Sanctuary (FKNMS) to protect the biological diversity and integrity of the marine environment in the Keys. Results of the monitoring program will be used in 5 years (year 2002) by Sanctuary managers to evaluate the zones' effectiveness in protecting marine biodiversity and, who will, based in part on that evaluation, determine the future use of zoning as a management tool. The effect of the zones will be determined by monitoring changes inside and outside of the no-take areas.

The primary purpose of the monitoring in the first five years will be to test the following hypotheses: 1) The abundance and average size of most exploited fish species will change significantly as a result of the no-take zones; 2) the abundance, average size, and size range of spiny lobster will change significantly as a result of the no-take zones; 3) the abundance of some mobile and sessile invertebrates, other than coral, will change significantly as a result of the no-take zones; and 4) the physical impacts from visitors will change significantly.

A hierarchical monitoring approach will be used consisting of the following three levels: Level I will focus on changes in ecosystem structure and function in the two largest zones and one research-only area where diving is prohibited, Level II will focus on changes in ecosystem structure (species abundances) and on changes in human activities and attitudes in the smaller no-take zones, and Level III will focus on changes in overall ecosystem health using volunteers in all of the zones.

This proposal addresses the Level II monitoring of changes in human values, distribution of activities, revenues, and economic impacts for the purpose of determining the socioeconomic effects of the zones.

RESTORATION BENEFITS: The Florida Keys National Marine Sanctuary represents the final downstream component of the South Florida ecosystem. As such it is essential to monitor biological and socioeconomic changes in the Sanctuary now while changes to the delivery of water quality and quantity are being made upstream. The Sanctuary's zone monitoring program will: 1) Provide monitoring of indicators of restoration effects, 2) contribute to a better understanding of the dynamics of the coastal ecosystem (region 6), and 3) provide information for a report card on the health of the South Florida ecosystem.

Time Line and Fiscal Year Budget (in thousands of dollars) for FKNMS Level I monitoring

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
NOAA	50	300	200	200	200	100										1,050
Subtotal	50	300	200	200	200	100										**$1,050**

TITLE: Florida Keys National Marine Sanctuary: Level II Monitoring of Seagrasses			
SUBREGION : 6	***PROJECT ID:*** FK38	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Monitoring	NOAA: $60,000	
PROJECT PLAN MANAGER: Haskell (305) 743-2437	***BASIS:*** 2	***TOTAL:*** $60,000	
LEAD ORGANIZATION(S): NOAA		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): Florida DEP/FMRI			
COUNTY(S): Monroe		***TOTAL:*** $20,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $40,000	
START: 1997	***END:*** 9/30/02	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: On July 1, 1997 NOAA and the State of Florida implemented the Nation's first large-scale marine zoning plan. Marine zoning is being implemented in the Florida Keys National Marine Sanctuary (FKNMS) to protect the biological diversity and integrity of the marine environment in the Keys. Results of the monitoring program will be used in 5 years (year 2002) by Sanctuary managers to evaluate the zones' effectiveness in protecting marine biodiversity and, who will, based in part on that evaluation, determine the future use of zoning as a management tool. The effect of the zones will be determined by monitoring changes inside and outside of the no-take areas.

The primary purpose of the monitoring in the first five years will be to test the following hypotheses: 1) The abundance and average size of most exploited fish species will change significantly as a result of the no-take zones; 2) the abundance, average size, and size range of spiny lobster will change significantly as a result of the no-take zones; 3) the abundance of some mobile and sessile invertebrates, other than coral, will change significantly as a result of the no-take zones; and 4) the physical impacts from visitors will change significantly.

A hierarchical monitoring approach will be used consisting of the following three levels: Level I will focus on changes in ecosystem structure and function in the two largest zones and one research-only area where diving is prohibited, Level II will focus on changes in ecosystem structure (species abundances) and on changes in human activities and attitudes in the smaller no-take zones, and Level III will focus on changes in overall ecosystem health using volunteers in all of the zones.

This proposal addresses the Level II monitoring of the change in seagrass populations in the 2 largest no-take zones for the purpose of determining the effects of the zones. Monitoring will occur in years 1 and 5 only.

RESTORATION BENEFITS: The Florida Keys National Marine Sanctuary represents the final downstream component of the South Florida ecosystem. As such it is essential to monitor biological and socioeconomic changes in the Sanctuary now while changes to the delivery of water quality and quantity are being made upstream. The Sanctuary's zone monitoring program will: 1) Provide monitoring of indicators of restoration effects, 2) contribute to a better understanding of the dynamics of the coastal ecosystem (region 6), and 3) provide information for a report card on the health of the South Florida ecosystem.

Time Line and Fiscal Year Budget (in thousands of dollars) for FKNMS Level I Monitoring																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
NOAA	20	00	00	00	30	10										60
Subtotal	20	0	0	0	30	10										**$60**

TITLE: Florida Keys National Marine Sanctuary: Level III Volunteer benthic monitoring			
SUBREGION : 6	***PROJECT ID:*** FK39	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Monitoring	NOAA: $100,000	
PROJECT PLAN MANAGER: Haskell (305) 743-2437	***BASIS:*** 2	***TOTAL:*** $100,000	
LEAD ORGANIZATION(S): NOAA		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): NGOs			
COUNTY(S): Monroe		***TOTAL:*** $20,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $80,000	
START: 1997	***END:*** 9/30/02	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: On July 1, 1997 NOAA and the State of Florida implemented the Nation's first large-scale marine zoning plan. Marine zoning is being implemented in the Florida Keys National Marine Sanctuary (FKNMS) to protect the biological diversity and integrity of the marine environment in the Keys. Results of the monitoring program will be used in 5 years (year 2002) by Sanctuary managers to evaluate the zones' effectiveness in protecting marine biodiversity and, who will, based in part on that evaluation, determine the future use of zoning as a management tool. The effect of the zones will be determined by monitoring changes inside and outside of the no-take areas.

The primary purpose of the monitoring in the first five years will be to test the following hypotheses: 1) The abundance and average size of most exploited fish species will change significantly as a result of the no-take zones; 2) the abundance, average size, and size range of spiny lobster will change significantly as a result of the no-take zones; 3) the abundance of some mobile and sessile invertebrates, other than coral, will change significantly as a result of the no-take zones; and 4) the physical impacts from visitors will change significantly.

A hierarchical monitoring approach will be used consisting of the following three levels: Level I will focus on changes in ecosystem structure and function in the two largest zones and one research-only area where diving is prohibited, Level II will focus on changes in ecosystem structure (species abundances) and on changes in human activities and attitudes in the smaller no-take zones, and Level III will focus on changes in overall ecosystem health using volunteers in all of the zones.

This proposal addresses the Level III volunteer monitoring of changes in benthic populations due to the effects of the no-take zones.

RESTORATION BENEFITS: The Florida Keys National Marine Sanctuary represents the final downstream component of the South Florida ecosystem. As such it is essential to monitor biological and socioeconomic changes in the Sanctuary now while changes to the delivery of water quality and quantity are being made upstream. The Sanctuary's zone monitoring program will: 1) Provide monitoring of indicators of restoration effects, 2) contribute to a better understanding of the dynamics of the coastal ecosystem (region 6), and 3) provide information for a report card on the health of the South Florida ecosystem.

Time Line and Fiscal Year Budget (in thousands of dollars) for FKNMS Level III monitoring																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
NOAA	20	20	20	20	20											100,000
Subtotal																**$100,000**

TITLE: Florida Keys National Marine Sanctuary: Level III Rapid Response			
SUBREGION : 6	***PROJECT ID:*** FK40	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Monitoring	NOAA: $300,000	
PROJECT PLAN MANAGER: Haskell (305) 743-2437	***BASIS:*** 2	***TOTAL:*** $300,000	
LEAD ORGANIZATION(S): NOAA		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): Reef Environmental Education Foundation			
COUNTY(S): Monroe		***TOTAL:*** $20,000	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $280,000	
START: 1997	***END:*** 9/30/02	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: The Florida Keys National Marine Sanctuary represents a dynamic environment affected by natural and human-caused perturbations that can alter the ecosystem. In order to segregate the natural and anthropogenic changes it is important to determine the causes of episodic events resulting in mass mortalities. This proposal addresses the establishment of a rapid response capability using a combination of a volunteer network and a team of experts to respond to episodic events (fish kills, red tide, coral bleaching, coral diseases) for the purpose of trying to determine cause and effect.

RESTORATION BENEFITS: The Florida Keys National Marine Sanctuary represents the final downstream component of the South Florida ecosystem. As such it is essential to monitor biological and socioeconomic changes in the Sanctuary now while changes to the delivery of water quality and quantity are being made upstream. The Sanctuary's zone monitoring program will: 1) contribute to a better understanding of the dynamics of the coastal ecosystem (region 6), and 2) provide information for a report card on the health of the South Florida ecosystem.

Time Line and Fiscal Year Budget (in thousands of dollars) for FKNMS Level III monitoring																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
NOAA	20	40	20	20	20	20	20	20	20	20	20	20	20	20		300,000
Subtotal	20	40	20	20	20	20	20	20	20	20	20	20	20	20		**$300,000**

TITLE: Florida Keys National Marine Sanctuary: Level III Fish Survey			
SUBREGION : 6	***PROJECT ID:*** FK41	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Management	***BUDGET CATEGORY:*** Monitoring	NOAA: $64,000	
PROJECT PLAN MANAGER: Haskell (305) 743-2437	***BASIS:*** 2	***TOTAL:*** $64,000	
LEAD ORGANIZATION(S): NOAA		***APPROPRIATED TO DATE:***	
SUPPORTING ORGANIZATION(S): Reef Environmental Education Foundation			
COUNTY(S): Monroe		***TOTAL:*** $12,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***REMAINING FINANCIAL REQUIREMENT:*** ***TOTAL:*** $52,000	
START: 1997	***END:*** 9/30/02	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: On July 1, 1997 NOAA and the State of Florida implemented the Nation's first large-scale marine zoning plan. Marine zoning is being implemented in the Florida Keys National Marine Sanctuary (FKNMS) to protect the biological diversity and integrity of the marine environment in the Keys. Results of the monitoring program will be used in 5 years (year 2002) by Sanctuary managers to evaluate the zones' effectiveness in protecting marine biodiversity and, who will, based in part on that evaluation, determine the future use of zoning as a management tool. The effect of the zones will be determined by monitoring changes inside and outside of the no-take areas.

The primary purpose of the monitoring in the first five years will be to test the following hypotheses: 1) The abundance and average size of most exploited fish species will change significantly as a result of the no-take zones; 2) the abundance, average size, and size range of spiny lobster will change significantly as a result of the no-take zones; 3) the abundance of some mobile and sessile invertebrates, other than coral, will change significantly as a result of the no-take zones; and 4) the physical impacts from visitors will change significantly.

A hierarchical monitoring approach will be used consisting of the following three levels: Level I will focus on changes in ecosystem structure and function in the two largest zones and one research-only area where diving is prohibited, Level II will focus on changes in ecosystem structure (species abundances) and on changes in human activities and attitudes in the smaller no-take zones, and Level III will focus on changes in overall ecosystem health using volunteers in all of the zones.

This proposal addresses the Level III volunteer monitoring of changes in reef fish populations due to the effects of the no-take zones.

RESTORATION BENEFITS: The Florida Keys National Marine Sanctuary represents the final downstream component of the South Florida ecosystem. As such it is essential to monitor biological and socioeconomic changes in the Sanctuary now while changes to the delivery of water quality and quantity are being made upstream. The Sanctuary's zone monitoring program will: 1) Provide monitoring of indicators of restoration effects, 2) contribute to a better understanding of the dynamics of the coastal ecosystem (region 6), and 3) provide information for a report card on the health of the South Florida ecosystem.

Time Line and Fiscal Year Budget (in thousands of dollars) for FKNMS Level III Monitoring																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
NOAA	12	13	13	13	13											64,000
Subtotal																**$64,000**

TITLE: Team OCEAN			
SUBREGION : 6	***PROJECT ID:*** FK42	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Public Information & Education	***BUDGET CATEGORY:*** Habitat Protection & Natural Resource Management	NOAA: (NOS) $680,000 State:	
PROJECT PLAN MANAGER: Mary Tagliarini (305)852-7717	***BASIS:*** 3	***TOTAL:*** $680,000	
LEAD ORGANIZATION(S): NOAA (Florida Keys National Marine Sanctuary)		***APPROPRIATED TO DATE:*** $40,000	
SUPPORTING ORGANIZATION(S):			
COUNTY(S): Monroe		***TOTAL:*** $40,000	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***REMAINING FINANCIAL REQUIREMENT:*** ***TOTAL:*** $640,000	
START: 1997	***END:*** 9/30/2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Team OCEAN (Ocean Conservation Education Action Network) is a new program being implemented by the Florida Keys National Marine Sanctuary (FKNMS). This outreach program is designed to provide on-water and dockside education to boaters, divers, snorkelors, and other sanctuary users about practical ways to protect the marine ecosystem and minimize physical impacts from boating activities in the Florida Keys. The first element of this new program has focussed on utilizing teams of qualified and trained volunteers who use sanctuary vessels to visit the most heavily utilized reefs throughout the Keys. Brochures, applicable regulations, boating tips, and other information is distributed to boaters by Team Ocean interpreters. Team OCEAN interpreters have also prevented numerous groundings through direct intervention on the water, significantly reducing potential injury to living coral. This result, along with the hundreds of personal contacts made with boaters by this team and the feedback received, indicate the success already being made in educating boaters on the water, and in significantly reducing physical impacts to the living resources in the sanctuary. This new program has expanded for wider coverage throughout the Keys as South Florida restoration funds have become available. The continuation of this program, including the implementation of additional phases required for full development of Team OCEAN, is entirely dependent upon South Florida restoration funds, as this program is not funded by FKNMS program funds.

RESTORATION BENEFITS: Significant reduction of injury to coral and other living resources due to the unintentional impacts from boating activities in the Florida Keys. A fully implemented Team OCEAN program will heighten the awareness of boaters as to the importance of proper boating practices in shallow local waters for protecting the fragile reefs in the Keys. This is especially important because of the rapidly growing numbers of both resident and visiting boaters. The Team OCEAN program is important to overall ecosystem restoration as a demonstrated means of preventing the continued physical destruction of coral reefs from boating impacts, and to help ensure the sustainability of this critical component of the South Florida ecosystem into the long-term future.

Time Line and Fiscal Year Budget (in thousands of dollars) for Team OCEAN

Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
NOAA (NOS)	40	160	160	160	160											
Subtotal	40	160	160	160	160											**$680**

TITLE: Coral Reef Classroom			
SUBREGION : 6	***PROJECT ID:*** FK43	***FINANCIAL REQUIREMENT:***	
PROGRAM CATEGORY: Public Information & Education	***BUDGET CATEGORY:*** Habitat Protection & Natural Resource Management	NOAA: (NOS) $110,320 State:	
PROJECT PLAN MANAGER: Ivy Kelly (305)852-7717	***BASIS:*** 3	***TOTAL:*** $110,320	
LEAD ORGANIZATION(S): NOAA (Florida Keys National Marine Sanctuary)/FDEP		***APPROPRIATED TO DATE:*** NOAA/FKNMS $20,515	
SUPPORTING ORGANIZATION(S):			
COUNTY(S): Monroe		***TOTAL:*** $20,515	
		REMAINING FINANCIAL REQUIREMENT:	
LINKED PROJECTS: **Dependent on:** **Critical to:** **Associated with:**		***TOTAL:*** $89,805	
START: 1997	***END:*** 9/30/2001	***APPROVED:*** 11/97	***LAST REVISION:*** 2/98

DESCRIPTION: Coral Reef Classroom (CRC) is a hands-on educational program conducted by the Florida Keys National Marine Sanctuary (FKNMS) to 8th grade students throughout the Florida Keys. which couples the scientific method with field observations in order to instill a personal sense of responsibility for environmental stewardship. The objectives of CRC are to teach basic coral reef ecology and biology; present concepts of habitat interdependence; engage in water quality sampling and evaluation; encourage analytical thinking and problem solving; demonstrate the role management plays in protecting natural resources; and inform students about careers in environmental science.

Each CRC cycle consists of two elements: a one-hour classroom presentation by FKNMS staff; and a five-hour boat/snorkeling excursion to the reef. Students experience their first hands-on practice with a Niskon bottle, Secchi disk, refractometer and dissolved oxygen sampling kit during the classroom session, along with a discussion about coral reef ecology. During the field trip, students have an opportunity to use these instruments and taught how to collect and record oceanographic data. A plankton tow along the shallow reef site completes the sampling component as students collect, observe and identify plankton. The remainder of the trip is spent snorkeling on the reef, where FKNMS staff and volunteers offer guidance on reef ecology and marine diversity.

RESTORATION BENEFITS: Educating students about coral reef ecology and south Florida environmental issues, along with increasing their awareness of the direct and indirect impacts on the ecosystem, will help toward building a long-term environmental ethic among young people. These students will inherit and become responsible for maintaining a sustainable environment in the future.

Time Line and Fiscal Year Budget (in thousands of dollars) for Team OCEAN																
Task	97	98	99	00	01	02	03	04	05	06	07	08	09	10	Unprog	Total
Program																
Project																
NOAA (NOS)	20.5	20.5	21.3	24.5	23.6											
Subtotal	20.5	20.5	21.3	24.5	23.6											**$110,320**

4.0

INTEGRATED SCIENCE PLAN

4.0 *INTEGRATED SCIENCE PLAN*

4.1 INTRODUCTION

This integrated science plan provides a framework for organizing the process for providing the scientific tools and knowledge needed by managers and policy makers to restore the South Florida ecosystem from the Kissimmee Lakes through the Florida Keys and reef tract. The strategy requires a cooperative network through which collective efforts are focused, results are timely, and information is shared among institutions and individuals. Adequate scientific information must be available in time to guide decisions at a series of critical stages in the redesign of the Central and Southern Florida Project. The term "science" in this plan includes the natural and social sciences, both of which must play an integral role in the development of a sustainable restoration plan.

Scientists have two major roles in the restoration process. One is to facilitate and promote the application of existing scientific information to planning and decision making. The other is to acquire critical missing information that can improve the probability that restoration objectives will be met. Scientists must provide immediate responses that use the best scientific knowledge currently available to plan and evaluate restoration actions. Simultaneously, scientists must facilitate well-focused investigations that improve the available scientific knowledge. It is critical that scientists actively engage in the restoration process while, at the same time, they build the knowledge that can be used to guide the process. Decisions are being made continuously in the multi-year process of project design and implementation. Immediately and in the longer time frame of the restoration effort, a scientific basis for these decisions is the key to restoration success. This science plan is an organizing framework to facilitate the two major roles.

Background

The functional ecology of the pre-drainage natural system is the theoretical target for restoration. The pre-drainage system supported the landscape patterns, clean and abundant water supplies, and large populations of wading birds, fish, and other wildlife that are essential components of a restored South Florida Ecosystem. Using quantitative estimates of pre-drainage hydrologic conditions as theoretical targets for remaining natural areas will ensure that changes brought about by restoration efforts are in the right direction. This approach does not favor one species or community over another, but, rather, the mix of species that occurred here naturally. It may not be possible to entirely regain the original species richness and wildlife abundance of South Florida due to irreversible changes that took place with the expansion of the modern human population. Rather, the object is to recapture the defining characteristics of the Everglades and other South Florida ecosystems.

Hydrologic restoration is viewed as the prerequisite to ecosystem restoration, and it is the working hypothesis of the South Florida ecosystem restoration effort that, once hydrologic restoration is achieved, ecological restoration will follow, providing water quality is improved and maintained. For this reason, the C&SF Project is the keystone undertaking of the restoration process. Other measures, in addition to hydrologic restoration, may be necessary once progress is made on restoring a more ecologically beneficial hydrologic regime.

Objectives

The following system-wide objectives for the South Florida Ecosystem Restoration were recommended in a 1993 Science Subgroup Report. To provide the scientific basis for these and more detailed, regional scale, objectives is the purpose of the Integrated Science Plan.

Restore water quality by reducing nutrients and contaminants
Restore pre-drainage relationships between rainfall and hydropatterns.
Restore timing and volume of freshwater flow through the system and into estuaries.
Restore natural sheet flow, reduce compartmentalization, and restore inter-regional linkages.
Restore dynamic water storage capacity.
Reduce habitat fragmentation and restore ecological connections.
Reestablish sustainable locally-breeding wildlife populations.
Recover endangered and threatened species.
Halt/reverse expansion of invasive non-native plant species.
Halt/reverse expansion of invasive nutrient-loving native plant species.
Increase spatial extent of wetlands.
Increase natural biological diversity and landscape heterogeneity.
Restore native vegetation communities, replacing lost communities.
Restore natural periphyton communities.
Restore coral cover.
Restore biological productivity of wetlands, estuaries, reefs, and fisheries.
Restore self-maintaining properties of natural and human systems.
Increase the beneficial linkages of agricultural, urban, and natural ecosystems.

Approach

The issues associated with restoration of South Florida's natural systems are so large in scale and geographically, ecologically, and socio-economically complex that a broadly integrated planning and coordinating process is needed to address them.

Natural and social scientists must pursue innovative approaches that will concurrently strengthen both human and environmental goals, rather than force choices from among the interest groups. With so many issues, scientific disciplines, and stakeholders involved, a detailed science plan is required.

This Integrated Science Plan is based on the view that restoration goals can best be met when a multi-disciplinary and multi-agency approach is used to identify and resolve the complex technical issues. The scientific community will make its strongest contributions by employing inclusive processes to create consensus positions on the major issues. The Science Coordination Team has the lead responsibility for encouraging and coordinating this integration of scientific effort.

Roles of Science

The Integrated Science Plan describes the primary processes and products which support the two major goals of science: (1) the acquisition of new information required to fill gaps in scientific knowledge critical to meeting the restoration goals, and (2) the creation of real-time processes by which scientists support managers and policy-makers in planning and evaluating restoration programs. The ISP addresses these two roles under the headings "Science Program" and "Science Application".

Structure

The Working Group has established a new structure to facilitate the interaction of scientists and managers in planning and evaluating projects related to the restoration. This structure is diagrammed in Figure 1.

Project Management Teams. The Working Group has delineated six regions and established a Project Management Team (PCT) for each region, as well as a Total System Project Management Team. The task of each PCT is to coordinate the restoration activities of its region. The Total System PCT must coordinate restoration activities that cut across several regions or apply to all or most of South Florida. Scientists have been assigned to each PCT. For each PCT, one scientist has been selected to represent the region on a Science Coordination Team.

Science Coordination Team. A Science Coordination Team (SCT) has been established by the Working Group to provide integration and

coordination of the interagency science program and science applications. The Science Coordination Team (SCT) is made up of seven members of the Working Group, one scientist from each PCT, and one scientist from each agency in the Working Group desiring to have representation on the SCT and not represented by a Working Group member on the SCT.

Special Topic Science Groups. Appropriate member of the Science Coordination Team should organize a standing group of scientific experts on special topics such as social science and ecological modeling to ensure that the SCT has the in-depth knowledge base for its planning and coordination responsibilities.

Scientific Review Panels. A set of Independent Scientific Review Panels will be established by the Science Coordination Team to review Strategic Science Plans and the science programs that become implemented. In reviewing the Plans, these standing panels will be asked to evaluate the appropriateness of the critical questions, the adequacy of the research design in addressing those questions, and the scientific merit of the approaches. Panel members to review strategic plans for a given region will be selected for their general knowledge of ecosystems specific to that region and processes most relevant to restoration in that area.

4.2 BUILDING SCIENTIFIC KNOWLEDGE

Development of New Information

The Science Coordination Team has responsibility for development of a framework science plan and for overseeing the development of a strategic science plan for each region and the total system. Each PCT Science Representative is requested to establish a team of scientists to develop a plan. Each regional plan should take into account the characteristic ecosystems and the restoration projects underway, or under discussion. The plan should identify issues, formulate critical scientific questions related to these issues, and focus on a research program addressing these questions. Strategic Science Plans should include modeling, monitoring, and empirical studies. They should include and integrate ongoing science projects that address the critical scientific questions. Emphasis of new work should be on filling information gaps. The region's PCT should be kept informed on the progress of the developing plan and its content and have the opportunity to make suggestions. Each Strategic Science Plan will be submitted to the Science Coordination Team through its respective PCT.

Communication

The SCT will work to promote improved communication among scientists involved in the restoration program. Multidisciplinary science conferences will be organized to present ongoing research. Workshops will be used to focus an exchange of information and ideas on specific technical issues.

Synthesis of Scientific Knowledge Relevant to Issues

Major scientific issues will be addressed by means of in-depth syntheses of existing scientific knowledge. Both the SCT and regional science teams will identify, and respond to, needs for in-depth synthesis of existing scientific knowledge. Papers will be developed that synthesize existing scientific knowledge relevant to major restoration issues. These papers may be organized into a book that provides the current state of knowledge about South Florida ecosystems and approaches to their restoration.

Integrated Data Management

Inventories will be conducted, and available databases will be archived in a multi-governmental data base management system accessible through Internet. The system will be updated routinely. A guide to the information available from each database will be developed.

4.3 APPLYING SCIENTIFIC KNOWLEDGE

Scientific knowledge and know-how is being applied directly to the restoration effort by the involvement of scientists in several major activities: (1) an applied science strategy and (2) a multi-species recovery plan.

The applied science strategy is being developed to help plan and evaluate restoration projects. Its initial application is in the selection of alternative redesigns of the South Florida water management system. The multi-species management plan is being developed to ensure that the future of each threatened and endangered species is evaluated in the context of the future quantity and quality of its habitat.

Applied Science Strategy

A science-based strategic process has been designed to provide a comprehensive framework for organizing existing scientific knowledge about the natural systems in South Florida into formats which are most applicable to the planning, implementation and evaluation of restoration projects at local and regional scales (Fig. 2).

The Applied Science Strategy includes three major steps, (1) the development of the conceptual models, (2) development of performance measures for key stressors and attributes identified by the models, and (3) the design of a comprehensive monitoring program based on the attributes and performance measures (Figure 3). Each step depends on the creation of scientific consensus, achieved through a series of technical workshops organized across multi-agency and multi-disciplinary lines. The first workshops identify the components of the conceptual models and the appropriate linkages in the models. In subsequent workshops, the performance measures are developed and the comprehensive monitoring program is designed. The simulation models developed in the science program will be applied in this process, as they become available.

Conceptual Models. The core of this process is a set of conceptual ecological models that propose the major causal relationships in the stressed ecosystems of south Florida. The conceptual models identify the societal drivers, resulting ecological stressors, and their effects on ecological systems. Each model identifies the principal ecological attributes (e.g., endpoints, and indicators) that characterize the "health" of each landscape/system and reflect the important ecological and societal values of the system.

The ultimate intent of the conceptual models is to (1) convert the broad, policy-level objectives that have been established for each restoration program into specific, measurable ecological indicators and (2) develop a suite of testable hypotheses that describe the major ecological responses to the restoration projects. These hypotheses become the basis for the restoration plans by identifying the ecological and physical modifications of the system that are necessary to achieve the restoration objectives. The conceptual models identify the major stressors and ecological attributes (e.g., indicators) that should best characterize how the system will respond to specific restoration actions. Hydrologic and biologic performance measures and a comprehensive ecological monitoring program will be based on the relationships expressed in these conceptual models.

As restoration programs are planned and implemented, simulation models and a well-focused monitoring program will show how the key attributes in each system respond relative to the performance measures. The simulation modeling and the monitoring provide an objective means of testing the validity of the conceptual models and hypotheses, reducing scientific uncertainty, identifying new research priorities, and modifying restoration actions (i.e., adaptive assessment).

Performance Measures. Developing performance measures is a high priority task in the restoration program. This task requires that a set of biological and physical parameters be identified which, collectively, can represent the response of the system to restoration efforts over a range of spatial, temporal, and ecological

scales. These performance measures are being used initially to evaluate simulation-modeling output produced to test proposed alternative redesigns of the water management system. Later, these performance measures will be monitored to evaluate how well specific parts of the project, once implemented, are meeting restoration objectives.

Several important efforts provided the initial information with which to develop performance measures. The former Science Sub-Group presented an initial set of suggested ecological and precurser (mainly hydrologic) success measures (Science Sub-Group 1997). Other hydrologic performance measures were developed to evaluate recent water management projects of the South Florida Water Management District that had ecological objectives. Ecological performance measures also have been proposed by the Man in the Biosphere Program (Harwell and Long 1992) and the National Audubon Society (Hoffman 1994).

The suite of conceptual ecological models recently created for the natural systems in South Florida provided a basis for identifying a set of restoration performance measures to evaluate various proposed restoration alternatives. The rationale was that restoration projects ought to be directed at correcting the stresses identified by the conceptual models because these models provide a consensus of scientific opinion regarding the major ecological components and causal links that characterize stressed natural systems in South Florida. In both the alternative evaluation process and follow-up monitoring of projects that are implemented, a set of performance measures that are linked to model components should provide a well founded indication of how well a restoration project meets its objectives.

The initial effort to use the conceptual models as a basis for refining the set of performance measures is focused on establishing 1st and 2nd order hydrological performance measures for the restoration projects. 1st order hydrological performance measures are derived from the hydrological stressors in the models. 1st order performance measures identify the specific hydrological conditions which, as suggested by the models, explain much of the ecological effects from altered water patterns and quality in south Florida. Because 1st order performance measures are derived from the stressor level in the models, they may use Natural Systems Model output as their default target (i.e., the difference between the current hydrological pattern and the pattern predicted by the NSM defines the source of the stress on the system).

2nd order hydrological performance measures are derived from the current, best understanding of the hydrological optima for each of the ecological attributes, which, in the models, link to one or more hydrological stressors. Although 2nd order performance measures are developed independently of NSM predictions, it is assumed that if the understanding of the hydrological requirements of the attributes is correct, those 2nd order hydrological performance measures should be consistent with NSM hydrological patterns.

Biological performance measures also are developed for each of the attributes in the models. In any conceptual model, these attributes will include the combination of populations, species, guilds, communities, and ecological functions which, collectively, will represent how that system responds to restoration projects. Biological performance measures should identify, for each attribute, the numerical, spatial, temporal, or organizational targets to be used to determine the success of restoration projects.

Comprehensive Ecological Monitoring Program. The Science Coordination Team will take the lead in coordinating the development and implementation of a regional, comprehensive monitoring program for the restoration projects. A comprehensive monitoring program is defined as one, (1) which uses a regionally standardized set of monitoring protocols, and, (2) which is designed to establish base-line and trend data for a common set of ecological parameters, at regional or system-wide spatial scales, and over time periods that are consistent with the temporal scales of restoration projects and ecological cycles. Additionally, such a

monitoring program becomes comprehensive when it measures responses by the full set of hydrological and biological performance measures established for the restoration projects.

The comprehensive monitoring program will build on current hydrological and ecological monitoring programs being conducted by federal and state agencies in south Florida. Existing programs will be reviewed for compatibility of protocols, completeness of spatial and temporal coverage's, and the adequacy of the current programs relative to the proposed set of performance measures. An integration of the current monitoring programs likely will reveal the need to initiate new monitoring projects, expand some existing projects, and terminate lower priority projects. By focusing the new monitoring program on the performance measures for the restoration projects, the observed responses are expected to much better reflect the affects that these projects have on the systems.

Multi-Species Recovery Plan

One of the most challenging aspects of the ecosystem restoration program for South Florida, and one of the most important science application issues, is the question of how to protect and enhance the status of over 60 federal and state listed species, while making major alterations to regional hydropatterns in order to achieve landscape scale recovery of natural systems. Population declines in most listed species are thought to have occurred due to loss or degradation of essential habitat. Some listed species have changed their range and habitat substantially in order to compensate for effects that urban, agriculture and water management practices have had on their original habitat. Responding to changes in water depth and distribution patterns, these species have come to depend on different areas of the managed system than they used in the natural system. Although the overall expectation is that system restoration will improve habitat conditions for all listed species, the restoration implementation period may create short term stresses on those species that may have to relocate again to adjust to restored hydropatterns.

As a means for anticipating, and planning for, the potential responses by listed species in the overall ecosystem restoration program, the Fish and Wildlife Service is leading the development of an integrated, comprehensive, multi-species recovery plan for the entire Kissimmee to Florida Bay basin. Overall, the multi-species plan will identify the strategies and thresholds which will best protect listed species in south Florida as we move forward with regional, ecosystem restoration programs. The plan will contain two sections. Part I will consist of species accounts for all listed species, describing biology and status and establishing the recovery goals and environmental compliance guidelines for each species. Part II will relate the habitat requirements of the listed species to the landscape characteristics of South Florida, identify specific land management actions necessary to recover listed species, identify jeopardy thresholds, and propose multi-species recovery strategies in the context of long-term objectives.